



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

AUG 14 2008

Lisa P. Jackson
Commissioner
State of New Jersey Department of Environmental Protection
PO Box 402
Trenton, NJ 08625-0402

Dear Commissioner Jackson:

Thank you for your recommendations on the status of fine particle pollution throughout New Jersey. Fine-particle pollution represents one of the most significant barriers to clean air facing our nation today. Health studies link these tiny particles – about 1/30th the diameter of a human hair – to serious human health problems including aggravated asthma, increased respiratory symptoms like coughing and difficult or painful breathing, chronic bronchitis, decreased lung function, and even premature death in people with heart and lung disease. Fine particle pollution can remain suspended in the air for long periods of time and create public health problems far away from emission sources. Reducing levels of fine-particle (PM_{2.5}) pollution is an important part of our nation's commitment to clean, healthy air.

We have reviewed the December 18, 2007 letter submitting New Jersey's recommendations on air quality designations for the most recent 24-hour PM_{2.5} standard. The revised standard is referred to as the "2006" 24-hour PM_{2.5} air quality standard. We have also reviewed the technical information submitted to support New Jersey's recommendations. We appreciate the effort New Jersey has made to develop this supporting information. Consistent with the Clean Air Act, this letter is to inform you that the Environmental Protection Agency (EPA) intends to support New Jersey's recommended designations and boundaries for the 2006 24-hour PM_{2.5} standard for the New York and Philadelphia Metropolitan nonattainment areas. For Knowlton Township, Warren County, EPA intends to modify New Jersey's recommended designation of nonattainment and classify it attainment/unclassifiable. At this time, EPA believes that there is insufficient information to conclude that the air quality in the area is nonattainment.

We have enclosed a detailed analysis of relevant areas that serves as the basis for EPA's preliminary concurrence with your state recommendations for the New York and Philadelphia Metropolitan areas, and the basis for our modification for Knowlton Township, Warren County. Should you have additional information that you wish to be considered by EPA in this process, please provide it to us by October 20, 2008.

EPA has taken steps to reduce fine particle pollution across the country, such as the Clean Diesel Program to dramatically reduce emissions from highway, nonroad and stationary diesel engines. In addition, state programs to attain the previous PM_{2.5} standards will also help to reduce unhealthy levels of fine particle pollution.

We intend to make final designation decisions for the 24-hour PM_{2.5} standard by December 18, 2008. If you have any questions, please do not hesitate to contact me. We look forward to a continued dialogue with you as we work together to implement the PM_{2.5} standards.

Sincerely,

A handwritten signature in black ink that reads "Alan J. Steinberg". The signature is written in a cursive, flowing style.

Alan J. Steinberg
Regional Administrator

Enclosure

cc: William O'Sullivan, NJDEP
Chris Salmi, NJDEP

Attachment 1

NEW JERSEY Area Designations For the 24-Hour Fine Particle National Ambient Air Quality Standard

The table below identifies the counties in New Jersey that EPA intends to designate as not attaining the 2006 24-hour fine particle (PM_{2.5}) standard.¹ A county will be designated as nonattainment if it has an air quality monitor that is violating the standard or if the county is determined to be contributing to the violation of the standard.

Area	New Jersey Recommended Nonattainment Counties	EPA's Intended Nonattainment Counties
Allentown-Bethlehem-Easton PA-NJ area	Warren County (partial) - Knowlton Township	None
New York-Northern New Jersey-Long Island, NY-NJ-CT area	Bergen County, Essex County, Hudson County, Mercer County, Middlesex County, Monmouth County, Morris County, Passaic County, Somerset County, and Union County	No change
Philadelphia-Wilmington, PA-NJ-DE area	Burlington County, Camden County, and Gloucester County	No change

EPA intends to designate the remaining counties in the state as “attainment/unclassifiable.”

EPA Technical Analysis for the Allentown-Bethlehem-Easton PA-NJ area

Discussion

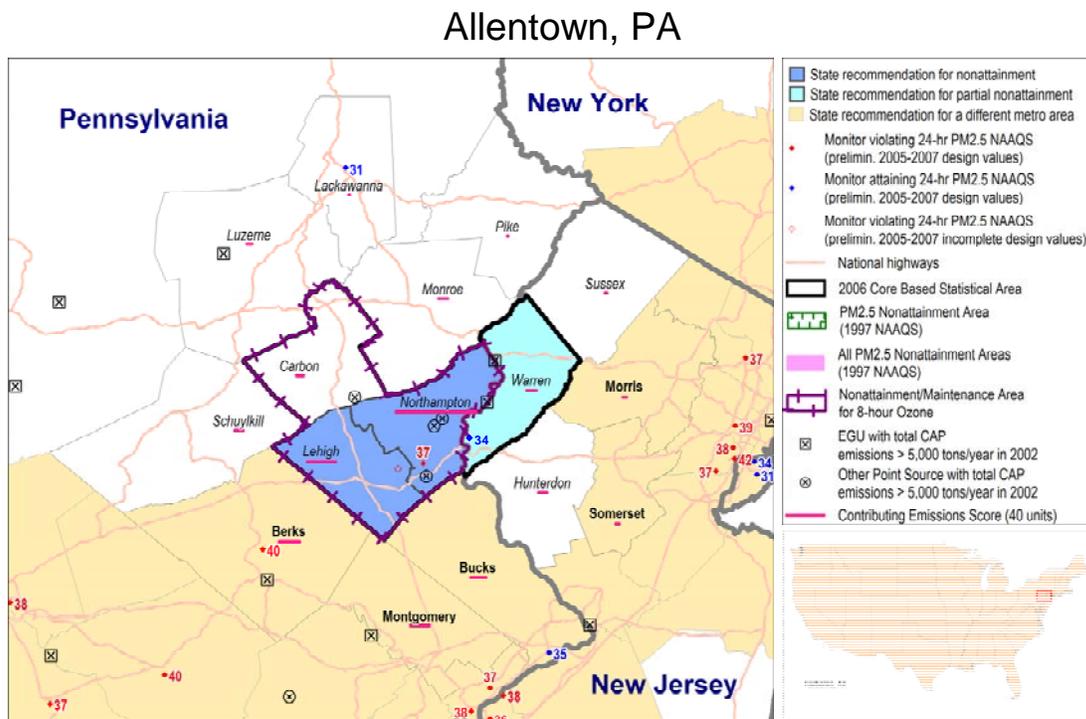
Pursuant to section 107(d) of the Clean Air Act, EPA must designate as nonattainment those areas that violate the NAAQS and those areas that contribute to violations. This technical analysis for the Allentown-Bethlehem-Easton PA-NJ (Allentown, PA-NJ) area

¹ EPA designated nonattainment areas for the 1997 fine particle standards in 2005. In 2006, the 24-hour PM_{2.5} standard was revised from 65 micrograms per cubic meter (average of 98th percentile values for 3 consecutive years) to 35 micrograms per cubic meter; the level of the annual standard for PM_{2.5} remained unchanged at 15 micrograms per cubic meter (average of annual averages for 3 consecutive years).

identifies the counties with monitors that violate the 24-hour PM_{2.5} standard and evaluates the counties that potentially contribute to fine particle concentrations in the area. EPA has evaluated these counties based on the weight of evidence of the following nine factors recommended in EPA guidance and any other relevant information:

- pollutant emissions
- air quality data
- population density and degree of urbanization
- traffic and commuting patterns
- growth
- meteorology
- geography and topography
- jurisdictional boundaries
- level of control of emissions sources

Figure 1 is a map of the counties in the area and other relevant information such as the locations and design values of air quality monitors, the metropolitan area boundary, and counties recommended as nonattainment by the State.



Counties labeled in bold reflect NAAs under 1997 NAAQS

Figure 1. Map of Allentown, PA area that includes Warren County, NJ

In December 2007, New Jersey recommended that Knowlton Township in Warren County be designated as “nonattainment” for the 2006 24-hour PM_{2.5} standard based on

modeled violations in the Knowlton Township area of Warren County. New Jersey's recommendation was received by EPA on December 18, 2007.

Air quality monitoring data on the composition of fine particle mass are available from the EPA Chemical Speciation Network and the IMPROVE monitoring network. Analysis of these data indicates that the days with the highest fine particle concentrations in the Allentown area occur predominantly in the warm season. The PM_{2.5} urban increment as noted in the below figures is dominated by total carbon in both the warm and cold season months (i.e. 79 percent in the warm season, and 90 percent in the cold season). Sulfates are above 20 percent in the warm season. Crustal components in the warm season, sulfates in the cold season, and nitrates were not found. Crustal was 10 percent of the cold season urban increment. Figures 2 and 3 show the "urban increment" to identify non-regional contribution of PM_{2.5} on high days for the Allentown, PA-NJ area.

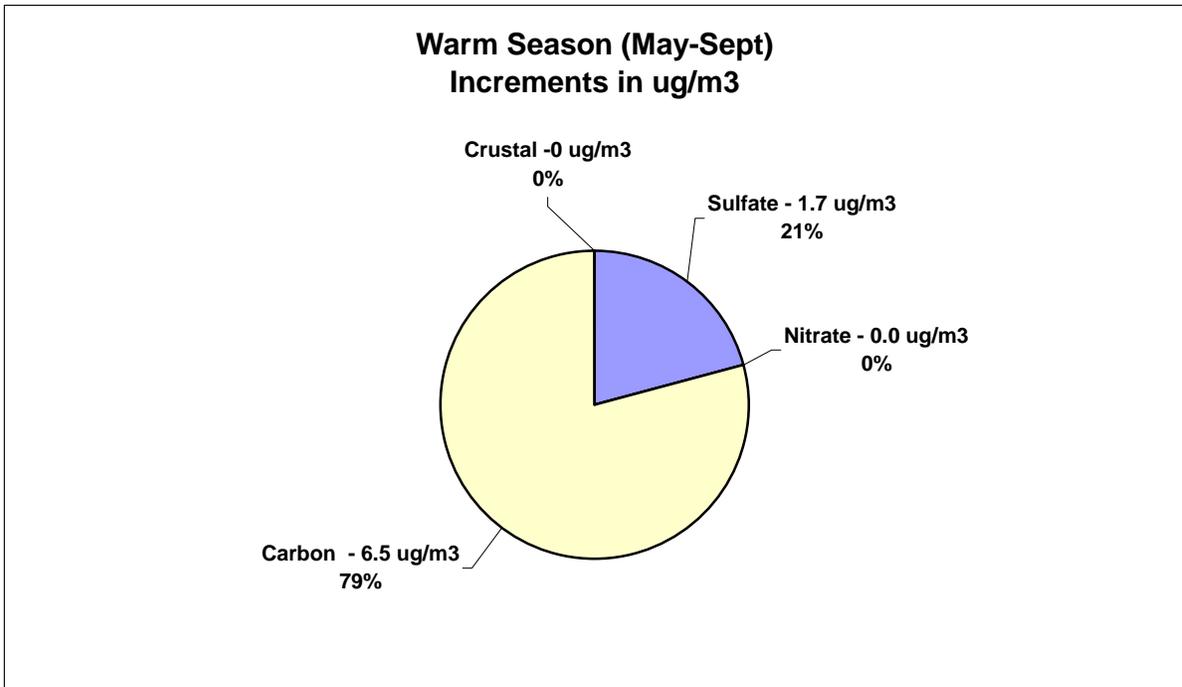


Figure 2. PM_{2.5} Compositional Analysis of Warm Season Urban Increment for Allentown, PA-NJ area. Total Urban Increment = 8.2 ug/m³

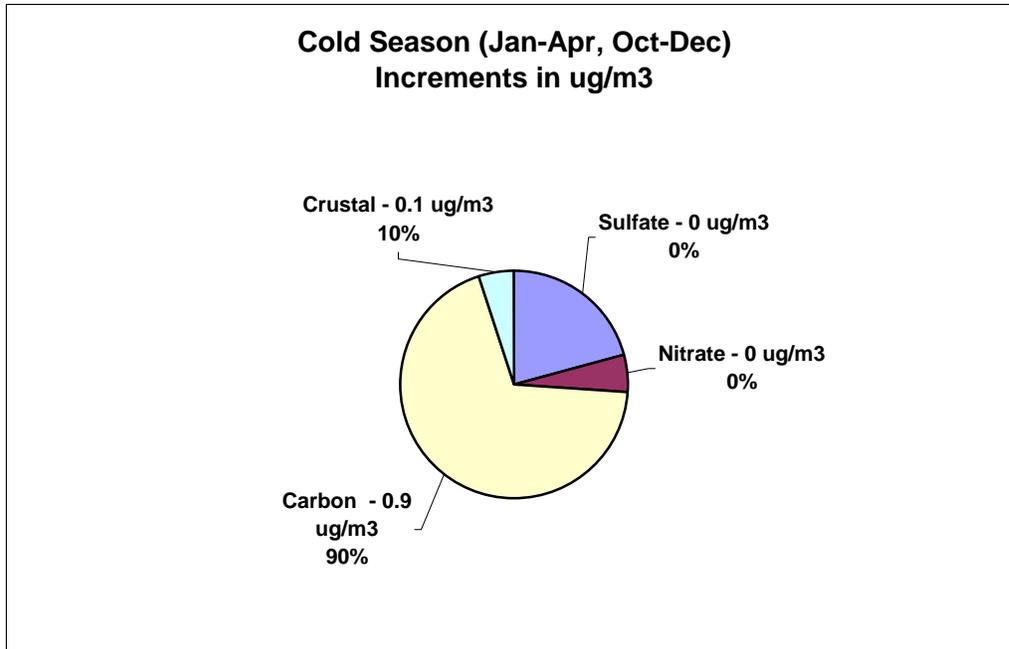


Figure 3. PM_{2.5} Compositional Analysis of Cold Season Urban Increment for Allentown, PA-NJ area. Total Urban Increment = 1 ug/m³

Based on EPA's technical analysis described below, EPA proposes that Warren County, New Jersey, in its entirety, be designated attainment/ unclassifiable. EPA has taken the state's request that Knowlton Township in Warren County be designated as "nonattainment" on the basis of air quality modeling analysis under consideration. However, current regulations for determining violations of the fine particle NAAQS² and current policy for designating nonattainment areas for the fine particle NAAQS³ require that violations of the PM_{2.5} standards be determined on the basis of complete, quality-assured ambient air quality monitoring data at a monitor in the area. These regulations and policy do not provide for PM_{2.5} violations to be determined through means other than ambient air quality monitoring. Thus, EPA finds that the information provided to date by the State does not adequately support a partial county nonattainment designation. EPA will consider any additional information provided by the State in making final decisions on the designations.

² See the regulations on the revised standard at 40 CFR 50.13(c); 71 FR 61224, October 17, 2006. See also monitoring regulations at 40 CFR Part 58, as revised on October 17, 2006 (see 71 FR 61236); and procedures for using these data to determine whether a violation has occurred in 40 CFR Part 50 Appendix N, as revised on October 17, 2006 (see 71 FR 61144).

³ See "Area Designations for the 24-Hour Fine Particle National Ambient Air Quality Standard," signed by Robert J. Meyers, Acting Assistant Administrator, June 7, 2007; http://www.epa.gov/ttn/naaqs/pm/docs/june_2007_guidance_for_area_designations_for_2006_24-hour_pm2.5.pdf

Allentown, PA-NJ area	State-Recommended Nonattainment Counties	EPA-Proposed Nonattainment Counties
New Jersey	Warren County (Partial) - Knowlton Township	None

The following is a summary of the technical analysis, including 9-factor analysis, for the EPA Region 2 portion of the Allentown, PA-NJ area.

EPA is proposing attainment/ unclassifiable for Warren, Sussex, and Hunterdon counties. These counties had low emissions, low Contributing Emission Scores (CES), low population, low commuting numbers, low growth, and low meteorological and geographical impact which indicates minimal contribution to violating monitors in the Allentown, PA-NJ area. These counties also do not have any violating ambient air quality monitors. Morris County has been recommended for inclusion in the Northern New Jersey-Long Island, NY-NJ-CT nonattainment area. Detailed information regarding the inclusion of Morris County into that area can be found in EPA’s Technical Analysis for the Northern New Jersey-Long Island, NY-NJ-CT nonattainment area.

Factor 1: Emissions data

For this factor, EPA evaluated county level emission data for the following PM_{2.5} components and precursor pollutants: “PM_{2.5} emissions total,” “PM_{2.5} emissions carbon,” “PM_{2.5} emissions other,” “SO₂,” and “NO_x”. “PM_{2.5} emissions total” represents direct emissions of PM_{2.5} and includes: “PM_{2.5} emissions carbon,” “PM_{2.5} emissions other”, primary sulfate (SO₄), and primary nitrate. (Although primary sulfate and primary nitrate, which are emitted directly from stacks rather than forming in atmospheric reactions with SO₂ and NO_x, are part of “PM_{2.5} emissions total,” they are not shown in Table 1 as separate items). “PM_{2.5} emissions carbon” represents the sum of organic carbon (OC) and elemental carbon (EC) emissions, and “PM_{2.5} emissions other” represents other inorganic particles (crustal). Emissions of SO₂ and NO_x, which are precursors of the secondary PM_{2.5} components sulfate and nitrate, are also considered.

Emissions data were derived from the 2005 National Emissions Inventory (NEI), version 1. See http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html.

EPA also considered the Contributing Emissions Score (CES) for each county. The CES is a metric that takes into consideration emissions data, meteorological data, and air quality monitoring information to provide a relative ranking of counties in and near an area. Note that this metric is not the exclusive way for consideration of data for these factors. A summary of the CES is included in Attachment 2, and a more detailed description can be found at http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html#C.

Table 1 shows emissions of PM_{2.5} and precursor pollutants components (given in tons per year) and the CES for violating and potentially contributing counties in the Allentown, PA-NJ area. Counties are listed in descending order by CES. The counties that are

currently designated nonattainment area for the 1997 PM_{2.5} NAAQS are shown in boldface.

County	State Recommended Non-attainment?	CES	PM _{2.5} emissions total (tpy)	PM _{2.5} emissions carbon (tpy)	PM _{2.5} emissions other (tpy)	SO ₂ (tpy)	NOx (tpy)
Northampton, PA	Yes	100	5,222	665	4,556	60,396	24,620
Lehigh, PA	Yes	35	1,328	501	828	3,749	11,503
Berks, PA	Yes-other	25	3,378	922	2,456	18,874	18,086
Montgomery, PA	Yes-other	23	2,597	1,118	1,477	5,411	23,306
Bucks, PA	Yes-other	19	2,022	876	1,146	3,951	16,792
Warren, NJ	Yes-Partial	12	1,105	588	517	563	5,088
Monroe, PA	No	12	1,153	590	563	1,022	5,245
Hunterdon, NJ	No	10	769	454	316	556	3,882
Schuylkill, PA	No	10	1,247	547	700	7,239	6,219
Carbon, PA	No	9	649	313	336	1,432	2,913
Morris, NJ	Yes-other	5	1,498	953	545	1,177	13,774
Sussex, NJ	No	3	1,270	744	526	669	2,726
Pike, PA	No	1	802	419	384	266	2,353

Table 1. PM_{2.5} Related Emissions and Contributing Emissions Score

Generally, New Jersey Counties have lower emissions than the other potentially contributing counties. CES scores were generally low for the New Jersey counties, which is indicative of low impact on the violating monitors in the area.

Hunterdon County, NJ has especially low emissions in comparison to the other counties in the area. Hunterdon, NJ emissions account for slightly over three percent of the total PM_{2.5} emissions, four percent of the carbon emissions, and about half of one percent of the total SO₂ emissions for the area. The CES score of 10 was consistent with low contribution.

Warren County, NJ also has relatively lower emissions than most of the other counties in the area. 2005 carbon emissions were 588 tons, which represents about six percent of the total emissions for the area under consideration. In comparison, other counties had much higher carbon emissions in the area, including Montgomery, PA (i.e. 1,118 tons), and Berks, PA (i.e. 922 tons). The CES score of 12 was consistent with lower contribution.

Morris County, New Jersey also had relatively higher carbon emissions (i.e. 953 tons) than most of the other counties in the area. Total PM_{2.5} emissions were 1,498 tons, which was mid-range when compared to the other counties. However, the CES score was very low (5 on a scale of 100), and Morris County has been recommended for inclusion in the Northern New Jersey-Long Island, NY-NJ-CT area. Morris County has been included in this area for the current annual PM_{2.5} standard and EPA believes that it is appropriate to keep Morris County in the Northern New Jersey-Long Island, NY-NJ-CT nonattainment area. Detailed information regarding the inclusion of Morris County into the Northern New Jersey-Long Island, NY-NJ-CT nonattainment area can be found in EPA's

Technical Analysis for the New York-Northern New Jersey-Long Island, NY-NJ-CT area.

Sussex County, NJ has very low SO₂ emissions in comparison to the other counties (less than 1% of the total SO₂ emissions). Carbon emissions were 744 tons, and total PM_{2.5} emissions were 1,270 tons, which was mid-range when compared to the other counties. However, the CES score was 3 on a scale of 100 indicating minimal contribution to the county with the violating monitor.

In their December 2007 recommendation to EPA, New Jersey used 2002 emissions and projected 2009 emissions from the 2002 MANE-VU Modeling Inventory. New Jersey evaluated the same New Jersey Counties in their analysis (i.e. Warren, Hunterdon, Sussex, and Morris). New Jersey also showed relatively lower emissions than the other counties in the area.

Factor 2: Air quality data

This factor considers the 24-hour PM_{2.5} design values (in µg/m³) for air quality monitors in counties in the Allentown, PA-NJ based on data for the 2005-2007 period. A monitor’s design value indicates whether that monitor attains a specified air quality standard. The 24-hour PM_{2.5} standards are met when the 3-year average of a monitor’s 98th percentile values are 35 µg/m³ or less. A design value is only valid if minimum data completeness criteria are met.

The 24-hour PM_{2.5} design values for counties in the Allentown, PA-NJ area are shown in Table 2.

County	State Recommended Non-attainment?	Design Values 2005-07 (µg/m ³)
Northampton, PA	Yes	37
Lehigh, PA	Yes	No monitor
Berks, PA	Yes-other	40
Montgomery, PA	Yes-other	No monitor
Bucks, PA	Yes-other	35
Warren, NJ	Partial	34
Monroe, PA	No	No monitor
Hunterdon, NJ	No	No monitor
Schuylkill, PA	No	No monitor
Carbon, PA	No	No monitor
Morris, NJ	Yes-other	32
Sussex, NJ	No	No monitor
Pike, PA	No	No monitor

Table 2. Air Quality Data

In EPA Region 2, there are no New Jersey counties in the Allentown, PA-NJ area that show a violation of the 24-hour PM_{2.5} standard as determined by air monitoring. The

2005-2007 design values for Warren and Morris counties are $34 \mu\text{g}/\text{m}^3$ and $32 \mu\text{g}/\text{m}^3$, respectively. The counties of Hunterdon, and Sussex, do not have monitors.

Northampton and Berks Counties in Pennsylvania, which are located in Region 3, violate the 24-hour $\text{PM}_{2.5}$ standard. The proximity of the Northampton, PA and Warren County, NJ is presented in Figure 4. Figure 5 shows the results of New Jersey's modeling analysis. Figures 6 and 7 show the similarity between the data collected from the monitors located in Northampton County, PA and Warren County, NJ.

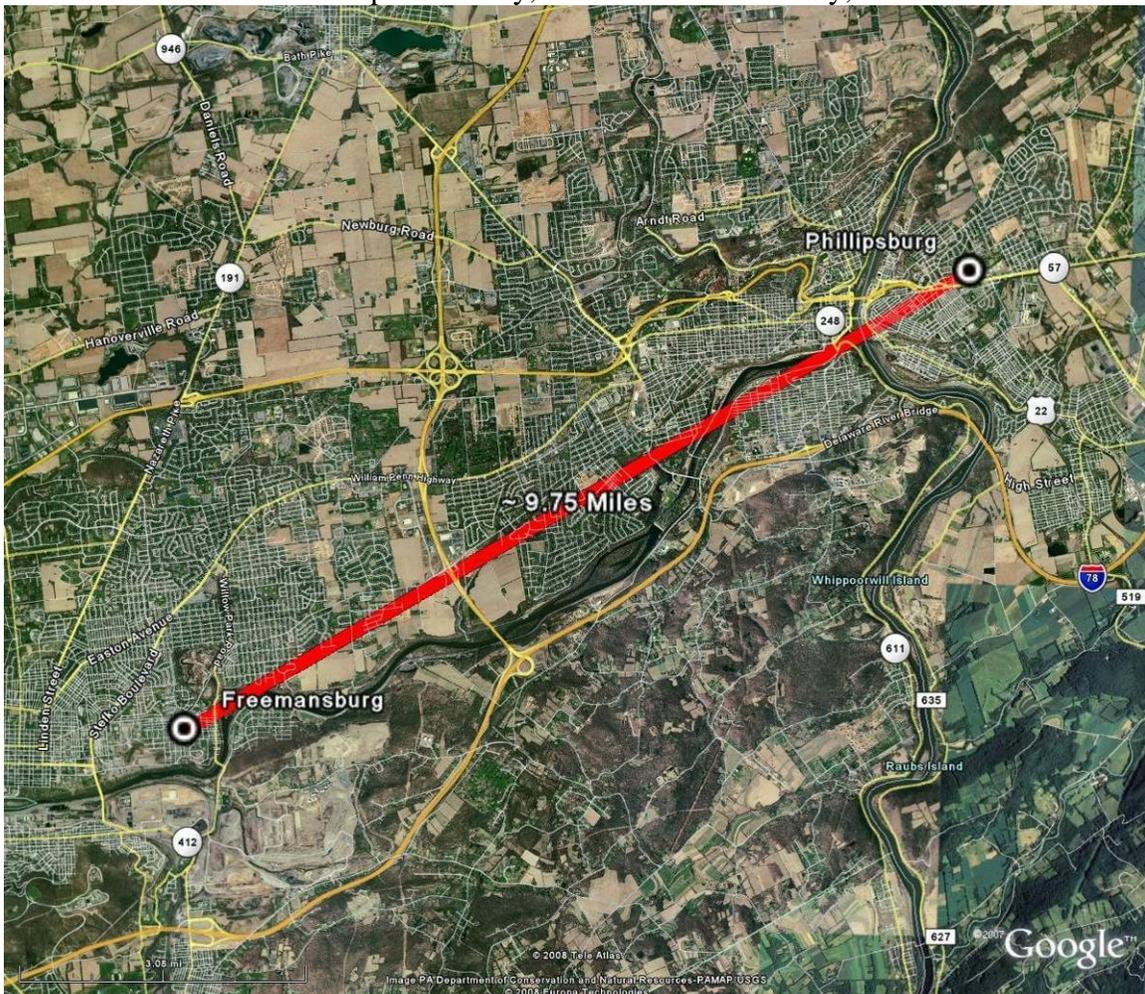


Figure 4. Map showing Freemansburg, PA and Phillipsburg, NJ.

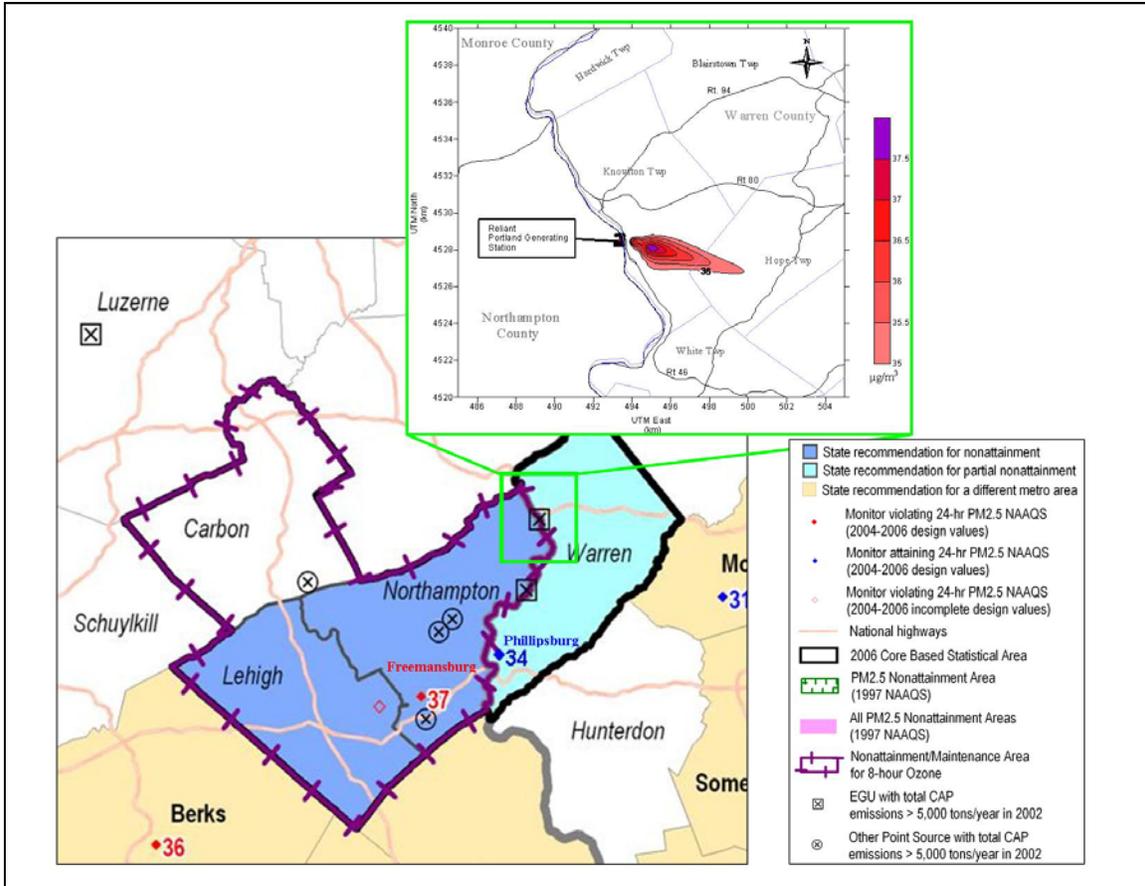


Figure 5. Map of the Allentown-Bethlehem-Easton PA-NJ area. The map insert shows modeling results provided by New Jersey, which the State identifies as information indicating a violation in Warren County.

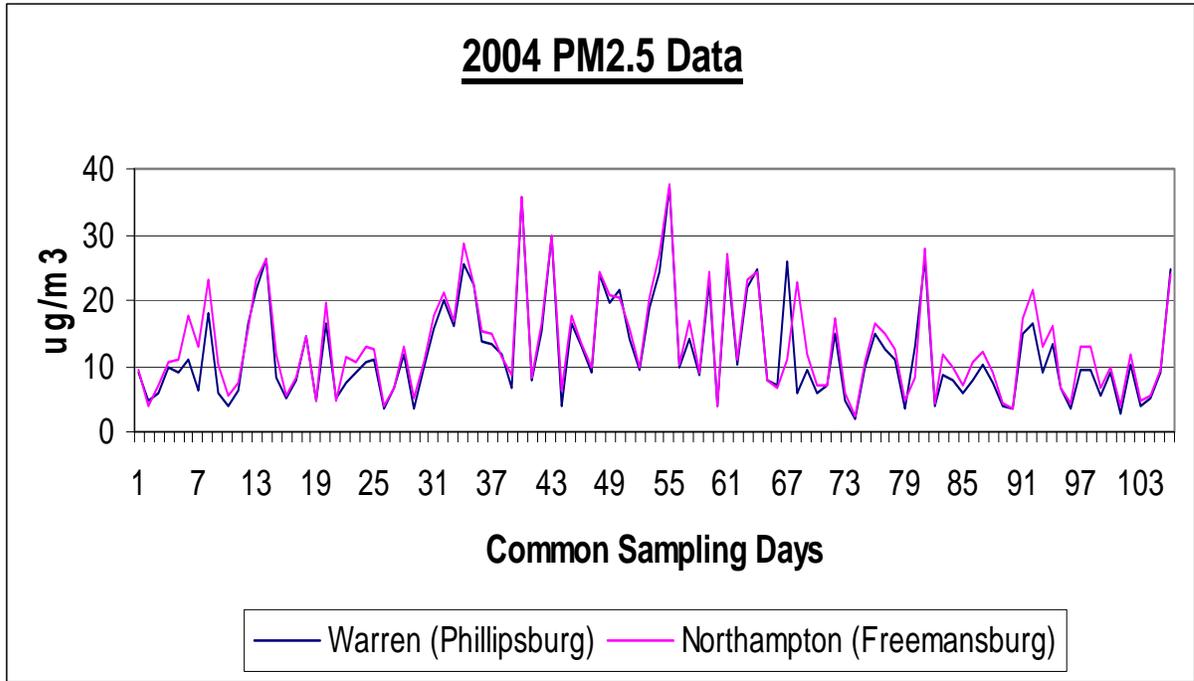


Figure 6. Comparison of 2004 Phillipsburg and Freemansburg Monitoring data

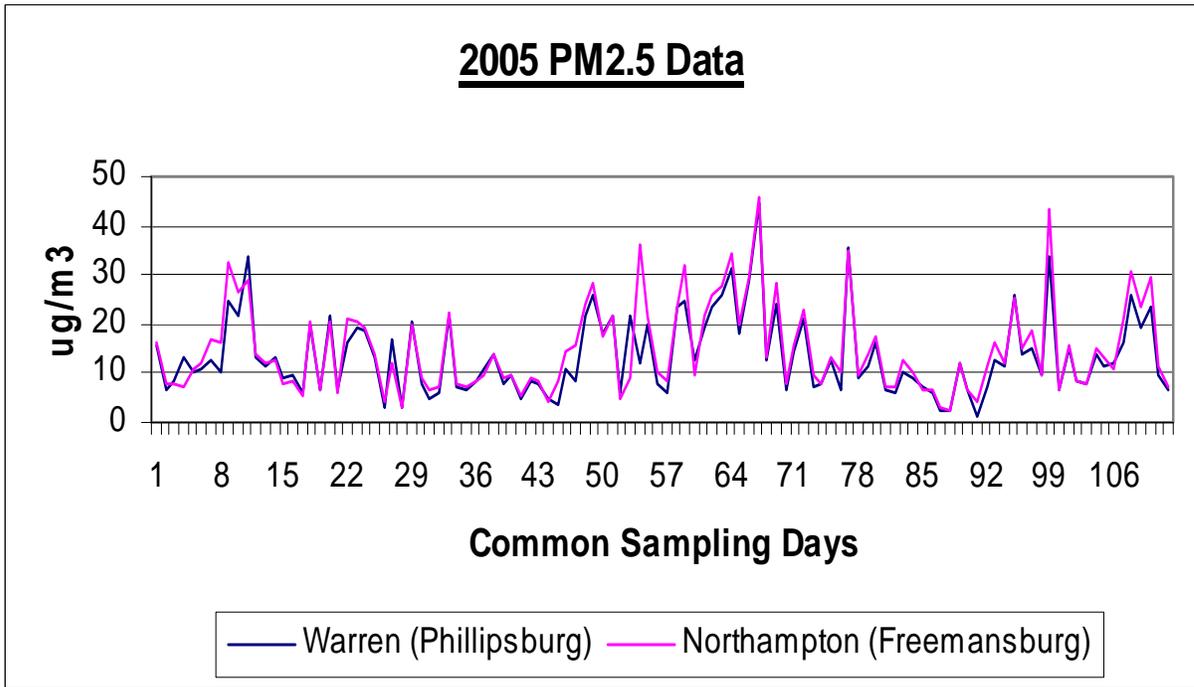


Figure 7. Comparison of 2005 Phillipsburg and Freemansburg Monitoring data

Note: Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) at population-oriented locations with a FRM or FEM monitor. All data from Special Purpose Monitors (SPM) using an FRM, FEM, or Alternative Reference Method (ARM) which has operated for more than 24 months is eligible for comparison to the relevant NAAQS, subject to the requirements given in the October 17, 2006 Revision to Ambient Air Monitoring Regulations (71 FR 61236). All monitors used to provide data must meet the monitor siting and eligibility requirements given in 71 FR 61236 to 61328 in order to be acceptable for comparison to the 24-hr PM_{2.5} NAAQS for designation purposes.

Factor 3: Population density and degree of urbanization (including commercial development)

Table 3 shows the 2005 population for each County in the area being evaluated, as well as the population density for each County in that area. Population data gives an indication of whether it is likely that population-based emissions might contribute to violations of the 24-hour PM_{2.5} standards.

Morris County ranks high in population and population density in comparison to other counties in the Allentown, PA-NJ Area. Morris County has been included in the New York City Metropolitan nonattainment area.

Hunterdon and Sussex County rank low in population and population density in comparison to other counties in the area. Hunterdon County has less than half the population and population density of the violating county of Northampton, PA. Sussex County also has less than half the population density and approximately half (53%) the population of Northampton, PA.

Warren County ranks low in terms of population and in population density in comparison to counties located near the violating monitor in Northampton. In comparison to the two counties that have been recommend as nonattainment for the Allentown, PA-NJ area, Warren County’s population and population density is below 50% that of Lehigh and Northampton.

Population density and degree of urbanization for Hunterdon, Sussex, and Warren counties are low for the area of analysis. Population-based emissions did not play a role in designation.

County	State Recommended Nonattainment	2005 Population	2005 Population Density (pop/sq mi)
Montgomery, PA	Yes-other	774,666	1591
Bucks, PA	Yes-other	619,772	998

Morris, NJ	Yes-other	490,084	1019
Berks, PA	Yes-other	396,236	458
Lehigh, PA	Yes	330,168	948
Northampton, PA	Yes	287,334	762
Monroe, PA	No	162,415	264
Sussex, NJ	No	152,726	285
Schuylkill, PA	No	146,996	188
Hunterdon, NJ	No	130,042	297
Warren, NJ	Yes-Partial	110,317	305
Carbon, PA	No	61,876	160
Pike, PA	No	56,180	99

The counties that are currently designated nonattainment for the 1997 PM_{2.5} NAAQS are shown in boldface.

Table 3. Population

Factor 4: Traffic and commuting patterns

This factor considers the number of commuters in each county who drive to another county within the Allentown-Bethlehem-Easton CBSA, the percent of total commuters in each county who commute to other counties within the Allentown, PA-NJ area, as well as the total Vehicle Miles Traveled (VMT) for each county in millions of miles (see Table 4). A county with numerous commuters is generally an integral part of an urban area and could be an appropriate county for implementing mobile-source emission control strategies, thus warranting inclusion in the nonattainment area.

County	State Recommended Non-attainment?	2005 VMT (million miles)	Number Commuting to any violating counties	Percent Commuting to any violating counties	Number Commuting into statistical area	Percent Commuting into statistical area
Berks, PA	Yes-other	3,320	147,990	83	7,250	4

Lehigh, PA	Yes	3,374	131,610	89	129,570	88
Northampton, PA	Yes	2,399	99,230	79	106,210	85
Schuylkill, PA	No	1,353	7,790	12	3,030	5
Carbon, PA	No	699	6,900	27	19,070	74
Montgomery, PA	Yes-other	7,527	6,660	2	2,480	1
Monroe, PA	No	1,556	5,140	8	7,060	11
Bucks, PA	Yes-other	5,250	3,980	1	3,870	1
Warren, NJ	Yes-Partial	1,342	2,410	5	23,440	47
Hunterdon, NJ	No	929	520	1	1,630	3
Pike, PA	No	584	200	1	360	2
Morris, NJ	Yes-other	5,398	130	0	1,760	1
Sussex, NJ	No	889	40	0	1,440	2

The counties that are in the currently designated nonattainment for the 1997 PM_{2.5} NAAQS are shown in boldface.

Table 4. Traffic and Commuting Patterns

The listing of counties on Table 4 reflects a ranking based on the number of people commuting to other violating counties.

The VMT for the residents of Warren County is low relative to other counties in the area. 47% of the commuting from Warren County commute into the statistical area. The total number of Warren County commuters into the statistical area and violating counties is in the middle range of all the counties considered for contribution to the Allentown, PA-NJ area. Based on Factor 4, Warren County is a low traffic and commuting contributor to the Allentown, PA-NJ area. Warren County, NJ does not rank high with respect to this factor.

For other counties in the Allentown, PA area, Morris, Hunterdon, and Sussex counties rank in the lower third for the number of commuters into the statistical area, and into the violating counties. Sussex and Hunterdon counties also have low VMT. Morris County, which is included as part of the New York City Metropolitan nonattainment area, has a high amount of VMT, but the low number of commuters into the Allentown-Bethlehem-Easton CBSA precludes the inclusion of Morris into the Allentown, PA nonattainment area.

Projections from the Federal Highway Administration show that average annual daily truck traffic is projected to increase in the area through 2020 for two roads that run through Warren County (Interstate 78 and Interstate 80). Morris, Hunterdon, and Sussex counties are also projected to have increases in truck traffic. The projected increase for all of the counties considered was not significant enough to play a role in the designation of the counties. Figure 8 shows projected 2020 annual average daily truck traffic.

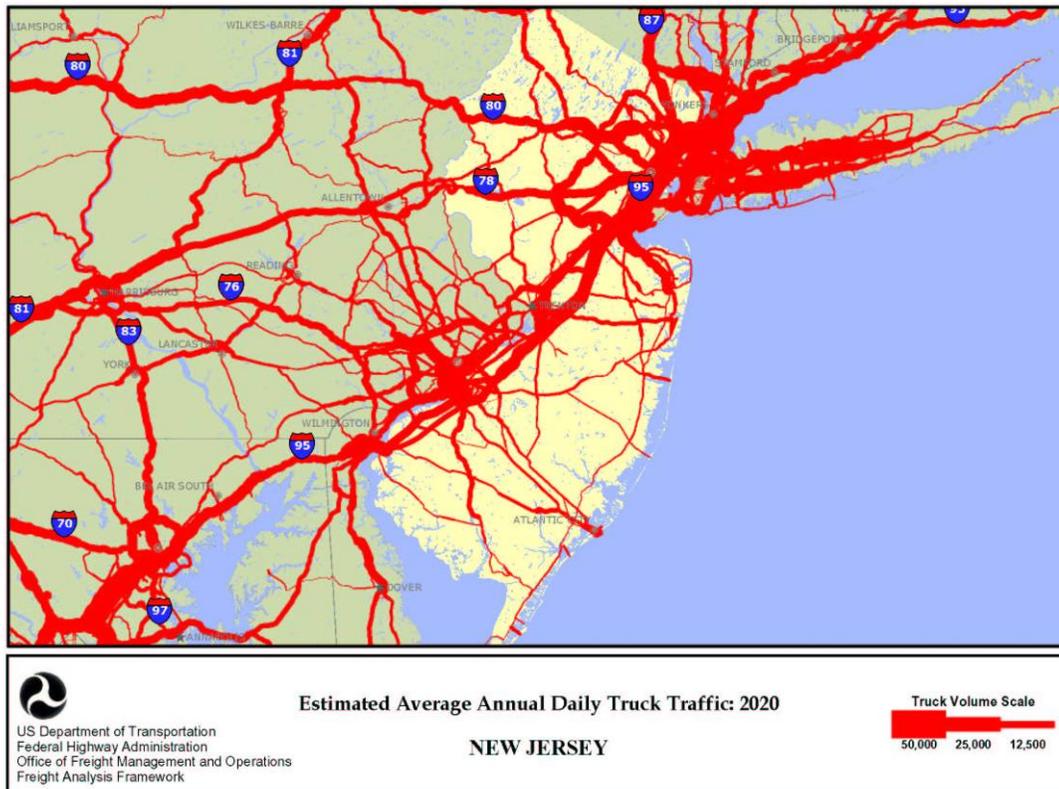


Figure 8. Estimated Average Annual Daily Truck Traffic in 2020

Note: The 2005 VMT data used for Table 4 and 5 of the 9-factor analysis has been derived using methodology similar to that described in “Documentation for the final 2002 Mobile National Emissions Inventory, Version 3, September 2007, prepared for the Emission Inventory Group, U.S. EPA. This document may be found at: ftp://ftp.epa.gov/EmisInventory/2002finalnei/documentation/mobile/2002_mobile_nei_version_3_report_092807.pdf

The 2005 VMT data were taken from documentation which is still draft, but which should be released in 2008.

Factor 5: Growth rates and patterns

This factor looks at expected population for 2000-2005 and VMT from 1996-2005 in the Allentown, PA-NJ area, as well as patterns of population and VMT growth. A county

with rapid population or VMT growth is generally an integral part of an urban area and could be an appropriate county for implementing mobile-source and other emission-control strategies, thus warranting inclusion in the nonattainment area.

Table 5 below shows population, population growth, VMT and VMT growth for counties that are included in the Allentown, PA-NJ area. Counties are listed in descending order based on VMT growth between 1996 and 2005.

County	2005 Population	Percent Population Change (2000-05)	Vehicle Miles Traveled in 2005 (millions annually)	Percent VMT Growth (1996-2005)
Montgomery, PA	774,666	3	7,527	73
Morris, NJ	490,084	4	5,398	56
Bucks, PA	619,772	3	5,250	49
Lehigh, PA	330,168	6	3,374	34
Northampton, PA	287,334	7	2,399	21
Monroe, PA	162,415	16	1,556	19
Berks, PA	396,236	6	3,320	11
Warren, NJ	110,317	7	1,342	2
Carbon, PA	61,876	5	699	0
Schuylkill, PA	146,996	-2	1,353	-1
Pike, PA	56,180	20	584	-8
Sussex, NJ	152,726	6	889	-22
Hunterdon, NJ	130,042	6	929	-42

The counties that are currently designated nonattainment in Table 5 for the 1997 PM_{2.5} NAAQS are shown in boldface.

Table 5. Population, VMT Growth, and Percent VMT Growth Change

Warren County experienced 7% growth from 2000-2005. The growth rate for Warren County is average in comparison to other counties in the area and equivalent to Northampton and Lehigh. On a per person basis, the growth in the number of people residing in Warren County is low. Only Carbon and Schuylkill had a lower percentage of population change. Montgomery, Berks, and Monroe County had the largest growth in population from 2000-2005.

VMT by the residents of Warren County are low in comparison with other counties in the area. The growth in VMT from 1996-2005 for Warren County is low in comparison with Northampton and Lehigh (21% and 34%, respectively). Hunterdon and Sussex counties had low population and negative VMT growth. The counties of Morris, Montgomery, and Bucks, had the highest percentage of growth from 1996-2005. Morris County is being included in the New York City Metropolitan nonattainment area.

Factor 6: Meteorology (weather/transport patterns)

For this factor, EPA considered the most representative National Weather Service wind direction and speed data throughout the year, with an emphasis on “high PM_{2.5} days” for each of two seasons (an October-April “cold” season and a May-September “warm” season). These high days are defined as days where any FRM or FEM air-quality monitors had 24-hour PM_{2.5} concentrations above 95% on a frequency distribution curve of PM_{2.5} 24-hour values.

For each air quality monitoring site, EPA developed a “pollution rose” to understand the prevailing wind direction and wind speed on the days with highest fine particle concentrations. The Figure 9 identifies 24-hour PM_{2.5} values by color; days exceeding 35 ug/m³ are denoted with a red or black icon. A dot indicates the day occurred in the warm season; a triangle indicates the day occurred in the cool season. The center of the figure indicates the location of the air quality monitoring site, and the location of the icon in relation to the center indicates the direction from which the wind was blowing on that day. An icon that is close to the center indicates a low average wind speed on that day. Higher wind speeds are indicated when the icon is further away from the center. For this factor, EPA also considered each County’s CES, which includes an analysis of trajectories of air masses for high PM_{2.5} days.

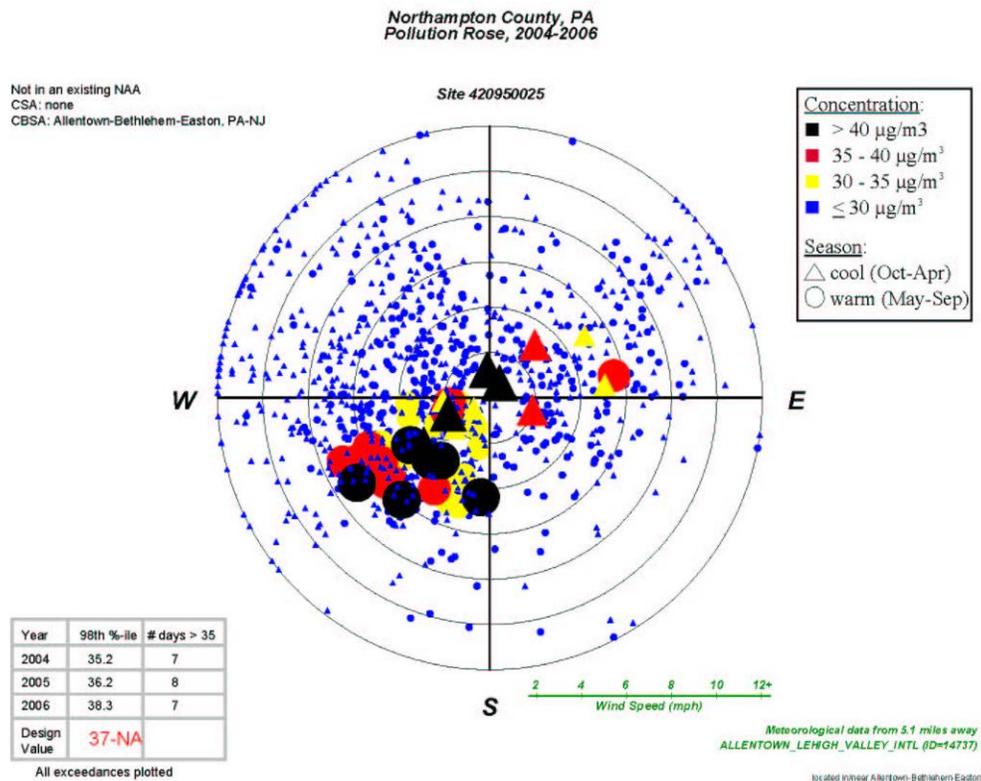


Figure 9. Pollution Rose for Northampton County, PA

Table 6 shows the average prevailing surface wind directions for high PM_{2.5} days by quadrant for the proposed nonattaining counties in the Allentown, PA-NJ area, as well as Warren County, NJ. The data shows that 24-hour PM_{2.5} concentrations are influenced by emissions in any direction at various times and the data also suggest that emissions in some directions relative to the violation are more likely to contribute than emissions in other directions.

County	Prevailing Wind Direction (%)			
	NW	SW	SE	NE
Northhampton County, PA	4%	74%	3%	19%
Lehigh County, PA	11%	78%	0%	11%
Warren County, NJ	0%	70%	10%	20%

Table 6. Prevailing Wind Directions for High PM_{2.5} Days.

EPA’s analysis of meteorology shows that PM_{2.5} emissions during high PM_{2.5} days in 2004-2006 primarily originated and/or passed through locations from a southwesterly direction. This is also evident upon examination of the pollution rose for Northampton County (see Figure 9). Since the winds are seldom from the Northeast, the emissions from Morris, Hunterdon, Sussex and Warren counties would have little or no impact on the PA counties.

Based on our analysis, this factor does not support including Morris, Hunterdon, Sussex and Warren County in the Allentown, PA-NJ nonattainment area.

Note: the meteorology factor is also considered in each county’s Contributing Emissions Score because the method for deriving this metric included an analysis of trajectories of air masses for high PM_{2.5} days.

Factor 7: Geography/topography (mountain ranges or other air basin boundaries)

The geography/topography analysis looks at physical features of the land that might have an effect on the air shed and, therefore, on the distribution of PM_{2.5} over the Allentown, PA-NJ area.

The Allentown, PA-NJ area does not have any geographical or topographical barriers significantly limiting air pollution transport within its airshed. The Delaware River separates Hunterdon and Warren counties from the other counties in the Allentown, PA-NJ area, however this is not a significant barrier that would influence the airshed. Morris and Sussex counties do not have any geographical or topographical barriers that could significantly limit air pollution transport. This factor did not play a significant role in the decision-making process

.

Factor 8: Jurisdictional boundaries (e.g., existing PM and ozone areas)

In evaluating the jurisdictional boundary factor, consideration should be given to existing boundaries and organizations that may facilitate air quality planning and the implementation of control measures to attain the standard. Areas designated as

nonattainment (e.g for PM_{2.5} or 8-hour ozone standard) represent important boundaries for state air quality planning.

The major jurisdictional boundary in the Allentown, PA-NJ nonattainment area is the State line between Pennsylvania and New Jersey.

While all of New Jersey has been previously designated nonattainment for 8-hour ozone, the New Jersey counties in the Allentown, PA-NJ area are not in the same 8-hour ozone nonattainment area as the counties from Pennsylvania. .

The Allentown, PA-NJ area is also not an existing nonattainment area for the 1997 PM_{2.5} NAAQS. In EPA's June 2007 Guidance for Area Designations for the 24-hr PM_{2.5} NAAQS, EPA had indicated that we expected that the boundaries for the existing 1997 PM_{2.5} nonattainment areas would have been appropriate for the boundaries of the new nonattainment areas for the 2006 PM_{2.5} NAAQS.

Although we considered this information regarding jurisdictional boundaries, the jurisdictional boundaries factor did not influence heavily in our decision-making for the area.

Factor 9: Level of control of emission sources

This factor considers emission controls currently implemented in the Allentown, PA-NJ area. This factor analysis generally considered the emissions controls currently in place.

The emission estimates on Table 1 (under Factor 1) include any control strategies implemented by the States in the Allentown, PA-NJ area before 2005 that may influence emissions of any component of PM_{2.5} emissions (i.e., total carbon, SO₂, NO_x, and crustal PM_{2.5}). Since we believe that the emissions listed in Table 1 have not changed significantly since 2005, this factor does not influence heavily in our decision-making.

In considering county-level emissions, EPA considered 2005 emissions data from the National Emissions Inventory. EPA recognizes that certain power plants or large sources of emissions in this potential nonattainment area may have installed emission controls or otherwise significantly reduced emissions since 2005 and that this information may not be reflected in this analysis. EPA will consider additional information on emission controls in making final designation decisions. In cases where specific plants already have installed emission controls or plan to install such controls in the near future, EPA requests additional information on:

- the plant name, city, county, and township/tax district
- identification of emission units at the plant, fuel use, and megawatt capacity
- identification of emission units on which controls will be installed, and units on which controls will not be installed

- identification of the type of emission control that has been or will be installed on each unit, the date on which the control device became / will become operational, and the emission reduction efficiency of the control device
- the estimated pollutant emissions for each unit before and after implementation of emission controls
- whether the requirement to operate the emission control device will be federally enforceable by December 2008, and the instrument by which federal enforceability will be ensured (e.g. through source-specific SIP revision, operating permit requirement, consent decree)

Other Relevant Information

The New Jersey Department of Environmental Protection (DEP) has performed an analysis using the CALPUFF air quality model, which indicates modeled violations in the Knowlton Township area of Warren County. The DEP analysis concluded that the Reliant power plant in Northampton County, PA is the cause of this modeled violation. New Jersey seeks to have only the Knowlton Township area of Warren County designated as nonattainment.

While the analysis indicates an impact in the Knowlton Township area, EPA has determined that there is insufficient information to conclude that the air quality violations of the fine particle NAAQS has occurred.. Current regulations and policy require that violations of the PM_{2.5} standards be determined on the basis of complete, quality-assured ambient air quality monitoring data at a monitor in the area. The regulations and policy do not provide for PM_{2.5} violations to be determined through means other than ambient air quality monitoring. Currently there is no violating monitor present in Warren County.

EPA recognizes that an air quality monitor located in the area of impact as determined by air quality modeling could show a violation of the 24-hour PM_{2.5} standard. For this reason, EPA strongly advises that New Jersey place an air quality monitor in the vicinity of Knowlton Township, which is downwind of the Reliant power plant in Northampton County, to support the state's determination that Warren County (or portions thereof) is violating the 24-hour PM_{2.5} standard.

EPA is recommending that the entire county of Warren be designated attainment/unclassifiable for the 24-hour PM_{2.5} standard

EPA Technical Analysis for the New York-Northern New Jersey-Long Island, NY-NJ-CT area

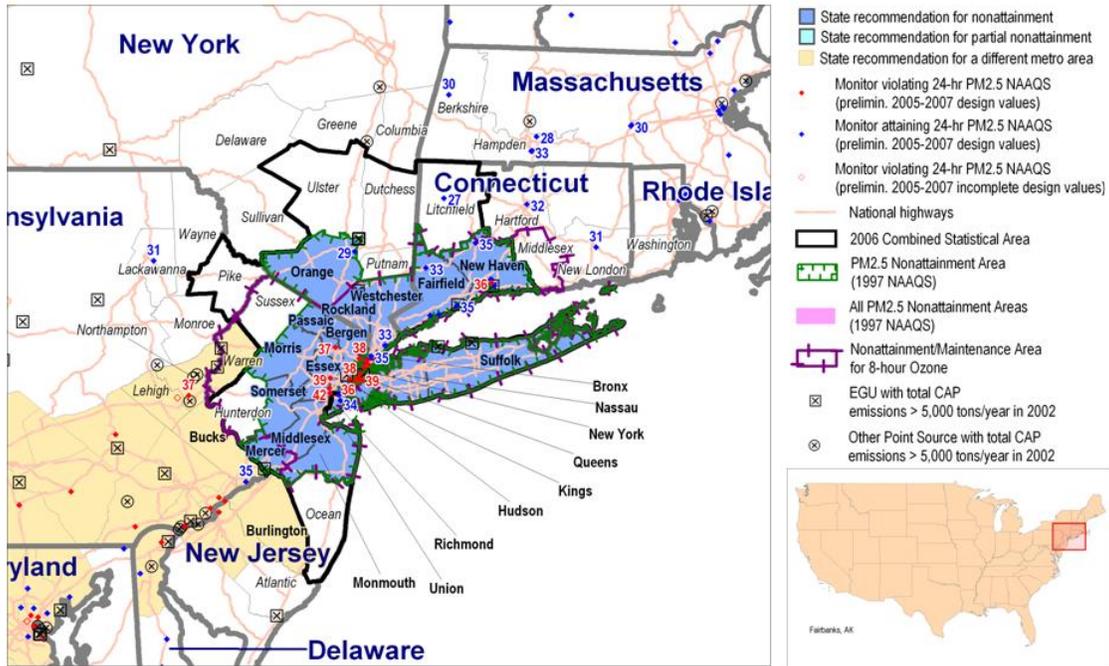
Discussion

Pursuant to section 107(d) of the Clean Air Act, EPA must designate as nonattainment those areas that violate the NAAQS and those areas that contribute to violations. This technical analysis for the New York-Northern New Jersey-Long Island, NY-NJ-CT (New York Metropolitan) area identifies the counties with monitors that violate the 24-hour PM_{2.5} standard and evaluates the counties that potentially contribute to fine particle concentrations in the area. EPA has evaluated these counties based on the weight of evidence of the following nine factors recommended in EPA guidance and any other relevant information:

- pollutant emissions
- air quality data
- population density and degree of urbanization
- traffic and commuting patterns
- growth
- meteorology
- geography and topography
- jurisdictional boundaries
- level of control of emissions sources

Figure 10 is a map of the counties in the area and other relevant information such as the locations and design values of air quality monitors, the metropolitan area boundary, and counties recommended as nonattainment by the State.

New York-N. New Jersey-Long Island, NY-NJ-CT



Counties labeled in bold reflect NAAs under 1997 NAAQS

Figure 10. New York-Northern New Jersey-Long Island, NY-NJ-CT area

For this area, EPA previously established PM_{2.5} nonattainment boundaries for the 1997 PM_{2.5} NAAQS that included ten full counties located in New Jersey.

In the state’s December 2007 letter to EPA, New Jersey recommended that the same counties be designated as “nonattainment” for the 2006 24-hour PM_{2.5} standard based on air quality data from 2004–2006. These data are from Federal Reference Method (FRM) monitors located in the state.

Air quality monitoring data on the composition of fine particle mass are available from the EPA Chemical Speciation Network and the IMPROVE monitoring network. Analysis of these data indicates that the days with the highest fine particle concentrations occur predominantly in the warm season. The PM_{2.5} urban increment as noted in the below figures is dominated by total carbon in both the warm and cold season months (i.e. 75 percent in the warm season, and 67 percent in the cold season). Sulfates are 25 percent in the warm, and 12 percent in the cold seasons. Nitrate was measured at 18 percent in the cold season and was insignificant in the warm season (~0%). Warm season nitrate and crustal components represent very small portions of the urban increment as noted in the above figures.

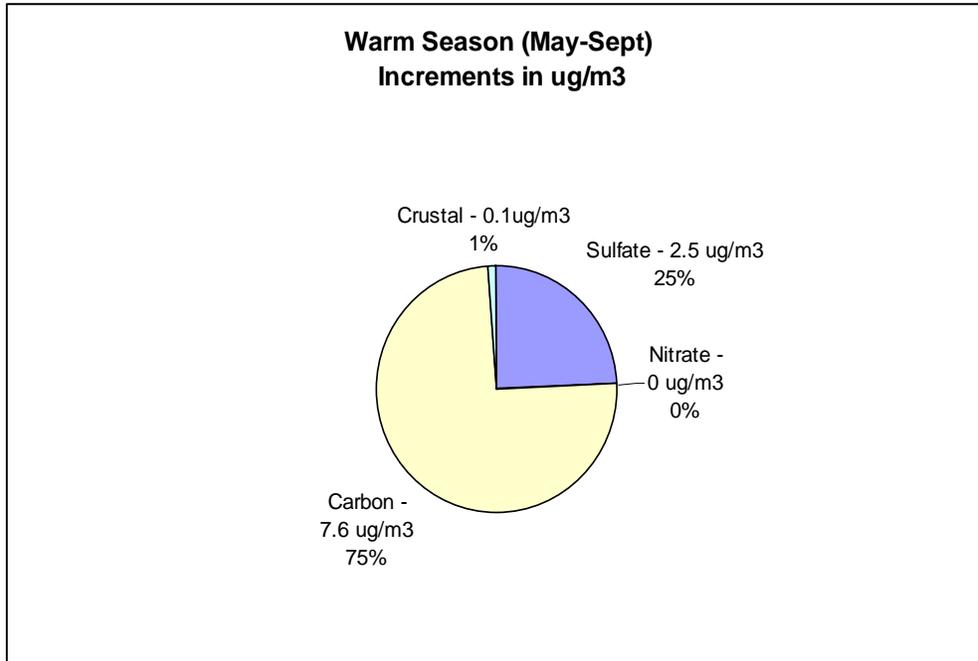


Figure 11. PM_{2.5} Compositional Analysis of Warm Season Urban Increment for the New York City Metropolitan area. Total Urban Increment = 10.2 ug/m³

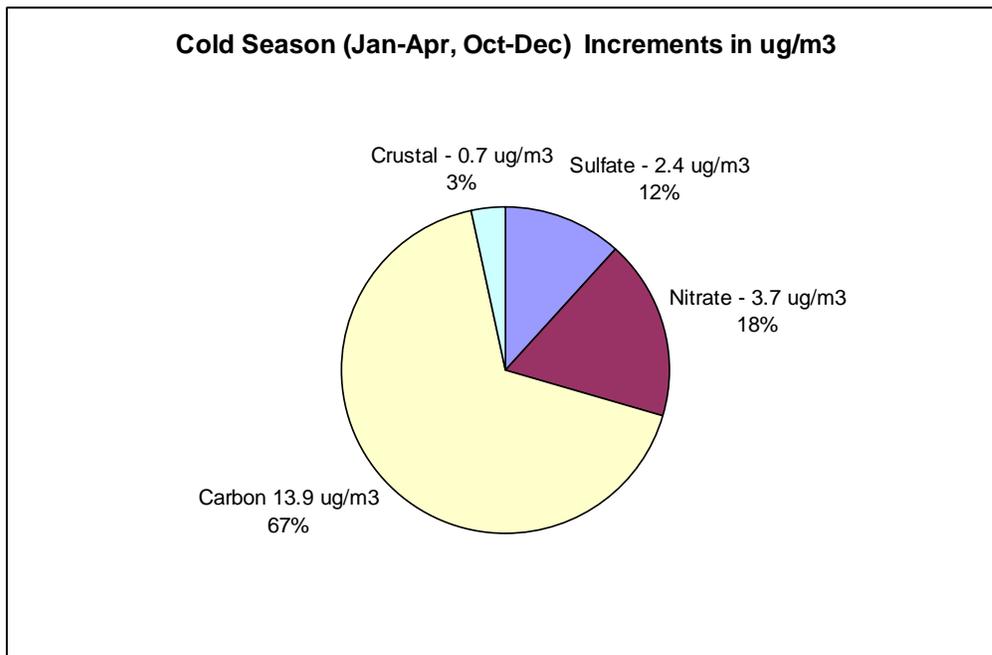


Figure 12. PM_{2.5} Compositional Analysis of Cold Season Urban Increment for the New York City Metropolitan area. Total Urban Increment = 20.7 ug/m³

Based on EPA's 9-factor analysis described below, EPA believes that the same counties as previously designated for PM_{2.5} should be designated nonattainment for the 24-hour PM_{2.5} air-quality standard as part of the for the New York City Metropolitan area

nonattainment area, based upon currently available information. These counties are listed in the table below.

New York City Metropolitan nonattainment area	State-Recommended Nonattainment Counties	EPA-Proposed Nonattainment Counties
New York	Bronx County, Kings County, Nassau County, New York County, Orange County, Queens County, Richmond County, Rockland County, Suffolk County, and Westchester County	No Change
New Jersey	Bergen County, Essex County, Hudson County, Mercer County, Middlesex County, Monmouth County, Morris County, Passaic County, Somerset County, and Union County	No Change

The following is a summary of the technical analysis, including a 9-factor analysis for the EPA Region 2 portion of the New York City Metropolitan area.

EPA is proposing attainment/ unclassifiable for Ulster, Dutchess, Sullivan, and Putnam counties in New York; and Warren, Hunterdon, Sussex, and Ocean counties in New Jersey. Sullivan, Putnam, Hunterdon, and Sussex counties had low emissions, low Contributing Emission Scores (CES), low population, low commuting numbers, low growth, and low meteorological and geographical impact which indicate minimal contribution to violating monitors in the New York City Metropolitan area. Ulster and Dutchess counties were low for all of the above factors, with the exception of moderate emissions. Warren and Ocean were low for all of the above factors, with the exception of higher growth rates, and higher population for Ocean County.

All of the counties which EPA is proposing as attainment/unclassifiable do not have any violating ambient air quality monitors.

EPA is proposing nonattainment for the counties of New York, Bronx, Queens, Kings, Richmond, Nassau, Suffolk, Westchester, Orange, and Rockland Counties in New York; and Union, Bergen, Essex, Hudson, Mercer, Middlesex, Monmouth, Morris, Passaic, and Somerset in New Jersey in the New York City metropolitan nonattainment area.

Factor 1: Emissions data

For this factor, EPA evaluated county level emission data for the following PM_{2.5} components and precursor pollutants: “PM_{2.5} emissions total,” “PM_{2.5} emissions carbon,” “PM_{2.5} emissions other,” “SO₂,” and “NO_x”. “PM_{2.5} emissions total” represents direct emissions of PM_{2.5} and includes: “PM_{2.5} emissions carbon,” “PM_{2.5} emissions other”, primary sulfate (SO₄), and primary nitrate. (Although primary sulfate and primary nitrate, which are emitted directly from stacks rather than forming in atmospheric reactions with SO₂ and NO_x, are part of “PM_{2.5} emissions total,” they are not shown in Table 7 as separate items). “PM_{2.5} emissions carbon” represents the sum of organic carbon (OC) and elemental carbon (EC) emissions, and “PM_{2.5} emissions other” represents other inorganic particles (crustal). Emissions of SO₂ and NO_x, which are precursors of the secondary PM_{2.5} components sulfate and nitrate, are also considered.

Emissions data were derived from the 2005 National Emissions Inventory (NEI), version 1. See http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html.

EPA also considered the Contributing Emissions Score (CES) for each county. The CES is a metric that takes into consideration emissions data, meteorological data, and air quality monitoring information to provide a relative ranking of counties in and near an area. Note that this metric is not the exclusive way for consideration of data for these factors. A summary of the CES is included in Attachment 2, and a more detailed description can be found at http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html#C.

Table 7 shows emissions of PM_{2.5} and precursor pollutants components (given in tons per year) and the CES for violating and potentially contributing counties in the New York City Metropolitan area. Counties are listed in descending order by CES. The counties that are currently designated nonattainment area for the 1997 PM_{2.5} NAAQS are shown in boldface.

County	State Recommended Nonattainment?	CES	PM _{2.5} emissions total (tpy)	PM _{2.5} emissions carbon (tpy)	PM _{2.5} emissions other (tpy)	SO ₂ (tpy)	NO _x (tpy)
Kings, NY	Yes	100	2,230	1,053	1,176	8,274	27,886
New York, NY	Yes	100	3,522	1,864	1,658	13,060	36,742
Hudson, NJ	Yes	100	2,933	671	2,261	27,305	26,889
Suffolk, NY	Yes	100	4,408	1,836	2,572	47,134	54,932
Fairfield, CT	Yes	100	3,056	1,630	1,426	9,533	26,382
Union, NJ	Yes	100	1,092	603	488	3,806	20,040

New Haven, CT	Yes	97	2,871	1,642	1,230	8,250	21,693
Queens, NY	Yes	78	2,976	1,430	1,545	18,460	40,922
Essex, NJ	Yes	77	942	637	304	4,647	22,221
Bronx, NY	Yes	58	1,106	535	571	3,703	14,362
Richmond, NY	Yes	Not Available	790	307	483	2,623	9,466
Bergen, NJ	Yes	48	1,219	886	333	1,691	23,827
Westchester, NY	Yes	43	1,751	947	805	4,770	24,755
Middlesex, NJ	Yes	42	1,549	951	598	3,129	29,172
Nassau, NY	Yes	41	2,149	1,091	1,058	6,203	31,877
Morris, NJ	Yes	24	1,498	953	545	1,177	13,774
Monmouth, NJ	Yes	21	1,506	989	517	1,789	16,771
Rockland, NY	Yes	20	1,296	327	968	12,711	12,777
Orange, NY	Yes	19	2,637	934	1,704	32,973	18,631
Mercer, NJ	Yes	16	1,658	579	1,079	17,891	17,640
Middlesex, CT	No	15	1,173	641	533	2,684	6,941
Somerset, NJ	Yes	15	801	451	349	577	7,886
Hartford, CT	No	14	2,713	1528	1,185	5,301	24,631
Passaic, NJ	Yes	12	755	471	284	733	8,770
Putnam, NY	No	9	636	306	329	1,116	5,367
Litchfield, CT	No	8	1,671	949	721	1,234	4,400
Dutchess, NY	No	7	1,711	783	929	4,637	7,955
Ocean, NJ	No	6	1,540	993	547	1,060	9,578
Hunterdon, NJ	No	6	769	454	316	556	3,882
Sussex, NJ	No	5	1,270	744	526	669	2,726
Warren, NJ	Yes, Partial - Allentown-Bethlehem-Easton PA-NJ	5	1,105	588	517	563	5,088

Ulster, NY	No	3	1,891	903	988	3,167	6,054
Sullivan, NY	No	1	1,096	561	535	922	2,203
Pike, PA	No	1	802	419	384	266	2,353

Table 7. PM_{2.5} Related Emissions and Contributing Emissions Score

Generally, New York and New Jersey Counties that are in the existing 1997 PM_{2.5} NAAQS nonattainment area for the New York City metropolitan area have much higher emissions than the adjacent counties. CES scores were generally low for the adjacent counties as well, which is indicative of low impact on the violating monitors that violate the 2006 PM_{2.5} NAAQS in the area.

In New York State, the counties with relatively high emissions include Suffolk, Queens, Nassau, Kings, New York, Westchester, and Orange Counties. Dutchess, Ulster, the Bronx, Richmond, and Rockland emissions were generally mid-range when compared to the other counties in the New York Metropolitan area. CES values were indicative of emissions levels, with the exception of Dutchess and Ulster Counties. CES scores were 7 and 3 respectively for Dutchess and Ulster, which are indicative of minimal contribution to violating monitors from Dutchess and Ulster emissions. Please see Factor 6, Meteorology, for further discussion on impact of emissions from Dutchess and Ulster County.

Putnam and Sullivan Counties in New York have low emissions in comparison to the other counties in the area. Putnam, NY emissions account for about one percent (i.e. 636 tons) of the total PM_{2.5}, one percent carbon emissions (i.e. 306 tons), less than half a percent of total SO₂ (1,116 tons), and one percent of NO₂ emissions (i.e. 5,367 tons) for the area under consideration. Sullivan County emissions represent about two percent of the total PM_{2.5} (1,096 tons), two percent of the carbon emissions (i.e. 561 tons), less than half a percent each of total SO₂ (922 tons) and NO₂ emissions (i.e. 2,203 tons) for the area under consideration. CES scores were 9 and 1 on a scale of 100 for Putnam and Sullivan, respectively, indicating minimal contribution to counties with violating monitors.

Putnam and Sullivan counties have low emissions, and very low CES scores. Based upon high emissions and high CES, Suffolk, Nassau, Kings, New York, Westchester, Bronx, Richmond, Queens, Orange, Rockland, Dutchess, and Ulster Counties are candidates for a 24-hour PM_{2.5} nonattainment designation

In New Jersey, the counties with relatively high emissions include Hudson, Middlesex, Bergen, Essex, Union, and Monmouth. Mercer, Morris, and Ocean were generally mid-range when compared to the other counties in the New York Metropolitan area. Somerset, Passaic, Hunterdon, Warren, and Sussex had low emissions in comparison to the other counties in the area. CES values were generally consistent with these emissions levels, with the exception of Ocean County. The Ocean County CES score was 6 on a scale of 100, which is indicative of minimal contribution to violating monitors from Ocean County emissions. Please see factor 6, Meteorology, for further discussion on impact of emissions from Ocean County.

Hunterdon, NJ emissions account for slightly over one percent (i.e. 769 tons) of the total PM_{2.5} emissions, one and half percent of the carbon emissions (i.e. 454 tons), and less than one percent of the total SO₂ emissions (i.e. 556 tons) and NO_x emissions (i.e. 3,882 tons) for the area. The CES score of 6 was consistent with minimal impact.

Warren County, NJ also has relatively lower emissions than most of the other counties in the area. 2005 total PM_{2.5} and carbon emissions were 1,105 tons and 588 tons, respectively, which represents about two percent of the total and carbon emissions for the area under consideration. SO₂ emissions (i.e. 563 tons) and NO_x emissions (i.e. 5,088 tons) were less than one percent of area emissions. The CES score of 5 was consistent with low contribution.

Sussex County, NJ had low total PM_{2.5} (1,270 tons), carbon (744 tons), SO₂ (669 tons), and NO_x emissions (2,726 tons). The CES score was 5 on a scale of 100 indicating minimal contribution to the county with the violating monitor.

Passaic and Somerset County emissions were also lower than many of the other counties in the area. For Passaic total PM_{2.5} was 755 tons, carbon emissions were 471 tons, SO₂ was 733 tons, and NO_x emissions were 8,770 tons. Somerset emissions were 801 tons for total PM_{2.5}, 451 tons for carbon emissions, 577 tons for SO₂, and 7,886 for NO_x emissions.

In its December 2007 recommendation to EPA, New Jersey used 2002 emissions and projected 2009 emissions from the 2002 MANE-VU Modeling Inventory. New Jersey also showed relatively lower emissions from Hunterdon, Warren, Sussex, Passaic, and Somerset Counties than the other counties in the area.

Based on emission levels and CES values, Hudson, Middlesex, Bergen, Essex, Union, Monmouth, Mercer, Morris, and Ocean are candidates for a 24-hour PM_{2.5} nonattainment designation. Passaic and Somerset Counties had CES scores of 12 and 15, respectively, and had relatively low emissions as shown in Table 7.

Factor 2: Air quality data

This factor considers the 24-hour PM_{2.5} design values (in µg/m³) for air quality monitors in counties in the New York City Metropolitan area based on data for the 2005-2007 period. A monitor's design value indicates whether that monitor attains a specified air quality standard. The 24-hour PM_{2.5} standards are met when the 3-year average of a monitor's 98th percentile values are 35 µg/m³ or less. A design value is only valid if minimum data completeness criteria are met.

The 24-hour PM_{2.5} design values for counties in the New York City Metropolitan area are shown in Table 8.

County	State Recommended Nonattainment	Design Values 2005-07 ($\mu\text{g}/\text{m}^3$)
Bronx, NY	Yes	39
Kings, NY	Yes	36
Nassau, NY	Yes	33
New York, NY	Yes	39
Orange, NY	Yes	29
Queens, NY	Yes	34*
Richmond, NY	Yes	34
Rockland, NY	Yes	No monitor
Suffolk, NY	Yes	32*
Westchester, NY	Yes	33
Bergen, NJ	Yes	38
Middlesex, NJ	Yes	34*
Monmouth, NJ	Yes	No monitor
Essex, NJ	Yes	39
Mercer, NJ	Yes	34*
Hudson, NJ	Yes	42
Union, NJ	Yes	42
Morris, NJ	Yes	31*
Passaic, NJ	Yes	37
Somerset, NJ	Yes	No monitor
Fairfield, CT	Yes	35
New Haven, CT	Yes	36
Hunterdon, NJ	No	No monitor
Ocean, NJ	No	31*
Sussex, NJ	No	No monitor
Warren, NJ	Yes, Partial - Allentown-Bethlehem-Easton PA-NJ	34

Hunterdon, NJ	No	No monitor
Pike, PA	No	No monitor
Litchfield, CT	No	27
Sullivan, NY	No	No monitor
Ulster, NY	No	No monitor
Dutchess, NY	No	No monitor
Putnam, NY	No	No monitor
Hartford, CT	No	32
Middlesex, CT	No	No monitor

** Data is from 2004-2006. 2005-2007 data was not available*

Table 8. Air Quality Data

In EPA Region 2, the Bronx, Kings, and New York Counties in New York; and Union, Essex, Hudson, Passaic, and Bergen Counties in New Jersey show a violation of the 24-hour PM_{2.5} standard. Fairfield and New Haven Counties in CT, which are located in Region 1, also violate the 24-hour PM_{2.5} standard.

This factor alone is not sufficient to eliminate the other counties in the New York Metropolitan area as candidates for nonattainment status. EPA considered each County's CES as well as the eight other factors (plus other relevant factors or circumstances) when determining which counties to include in the New York Metropolitan area nonattainment area.

Many of the violating monitors are near major transportation routes, which is an indication of a significant mobile source contribution. Counties in the New York Metropolitan area with large populations, and large number of commuters in the New York Metropolitan area (see discussion in Factors 3 and 4 below) and limited transportation routes for goods and service delivery are relevant considerations when determining the counties to include in the nonattainment area. Figures 13 and 14 show the New York Metropolitan area, including monitor locations, and major roadways.

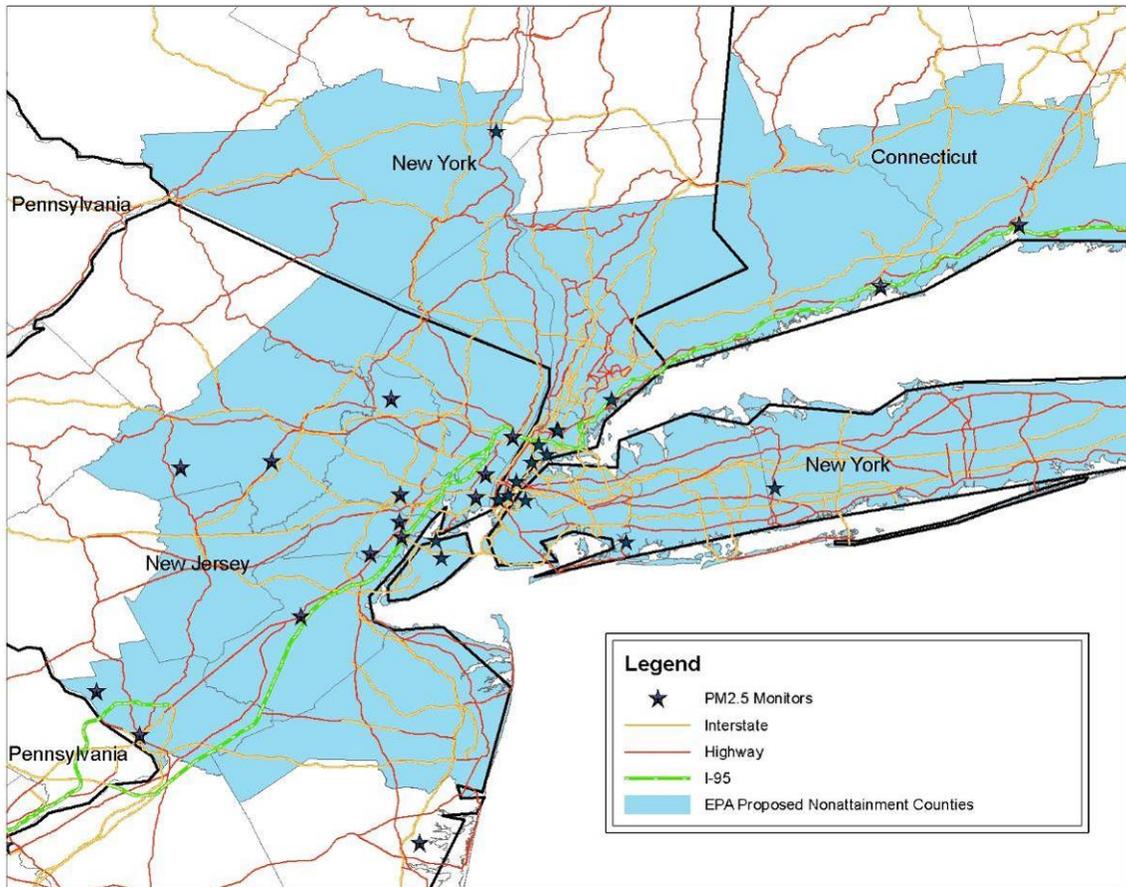


Figure 13. Map of the New York metropolitan area

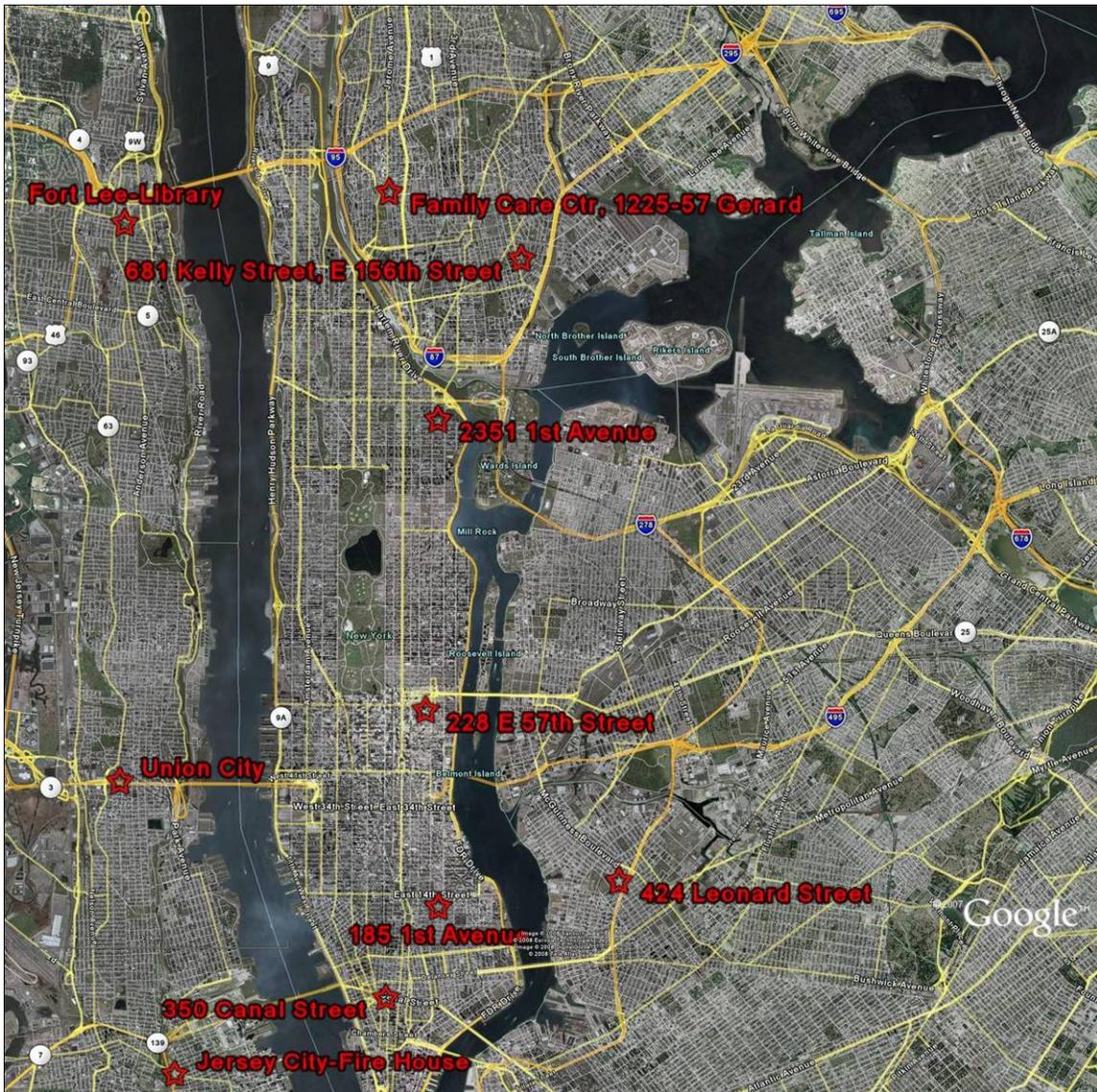


Figure 14. Detailed view of the New York City area. Red stars show the location of PM_{2.5} monitors.

Note: Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) at population-oriented locations with a FRM or FEM monitor. All data from Special Purpose Monitors (SPM) using an FRM, FEM, or Alternative Reference Method (ARM) which has operated for more than 24 months is eligible for comparison to the relevant NAAQS, subject to the requirements given in the October 17, 2006 Revision to Ambient Air Monitoring Regulations (71 FR 61236). All monitors used to provide data must meet the monitor siting and eligibility requirements given in 71 FR 61236 to 61328 in order to be acceptable for comparison to the 24-hr PM_{2.5} NAAQS for designation purposes.

Factor 3: Population density and degree of urbanization (including commercial development)

Table 9 shows the 2005 population for each county in the area being evaluated, as well as the population density for each county in the New York City Metropolitan area. Population data give an indication of whether it is likely that population-based emissions might contribute to violations of the 24-hour PM_{2.5} standards. Table 9 is sorted by 2005 population.

Due to their large concentrated population and relative land area size, the counties within New York City (i.e., New York, Bronx, Kings, Queens, and Richmond counties) have high population densities and high population relative to the remainder of the area. Suffolk, Nassau, Westchester, Orange, and Rockland counties in New York; and Middlesex, Essex, Monmouth, Hudson, Ocean, Union, Passaic, Morris, Mercer, and Somerset counties in New Jersey, also scored high in population and/or population density.

Of the counties listed in Table 9, most of the counties recommended for nonattainment have a CES score of greater than 10, with the exception of Hartford, CT. These high CES counties have high populations and high population densities indicating possible population-based emissions contribution.

County	State Recommended Nonattainment	2005 Population	2005 Population Density (pop/sq mi)
Kings, NY	Yes	2,511,408	37206
Queens, NY	Yes	2,256,576	20477
New York, NY	Yes	1,606,275	70451
Suffolk, NY	Yes	1,472,086	1369
Bronx, NY	Yes	1,364,566	31882
Nassau, NY	Yes	1,331,620	4289
Westchester, NY	Yes	947,719	1989
Bergen, NJ	Yes	902,308	3718
Fairfield, CT	Yes	901,086	1385
Hartford, CT	No	875,422	1168
New Haven, CT	Yes	844,510	1358
Middlesex, NJ	Yes	789,283	2487
Essex, NJ	Yes	789,166	6099
Monmouth, NJ	Yes	634,841	1308

Hudson, NJ	Yes	602,970	11208
Ocean, NJ	No	558,170	738
Union, NJ	Yes	530,710	5035
Passaic, NJ	Yes	496,985	2525
Morris, NJ	Yes	490,084	1019
Richmond, NY	Yes	475,014	7625
Orange, NY	Yes	372,750	445
Mercer, NJ	Yes	366,070	1601
Somerset, NJ	Yes	319,830	1049
Rockland, NY	Yes	294,636	1479
Dutchess, NY	No	294,509	357
Ulster, NY	No	182,433	157
Sussex, NJ	No	152,726	285
Hunterdon, NJ	No	130,042	297
Warren, NJ	Yes, Partial - Allentown-Bethlehem-Easton PA-NJ	110,317	305
Putnam, NY	No	100,528	409
Sullivan, NY	No	76,155	77

Note: The counties that are in the nonattainment area for the 1997 PM_{2.5} NAAQS are shown in boldface.

Table 9. Population

Factor 4: Traffic and commuting patterns

This factor considers the number of commuters in each county who drive to another county within the New York City Metropolitan area, the percent of total commuters in each county who commute to violating counties within the New York City Metropolitan area, as well as the total Vehicle Miles Traveled (VMT) for each County in millions of miles (see Table 10). A county with numerous commuters is generally an integral part of an urban area and could be an appropriate county for implementing mobile-source emission control strategies, thus warranting inclusion in the nonattainment area.

The listing of counties in Table 10 reflects a ranking based on the number of people commuting to any violating county.

County	State Recommended Non-attainment?	2005 VMT (million miles)	Number Commuting to any violating counties	Percent Commuting to any violating counties	Number Commuting into statistical area	Percent Commuting into statistical area
Kings, NY	Yes	4,899	861,160	96	895,130	99
Queens, NY	Yes	7,839	833,770	90	925,290	99
New York, NY	Yes	4,378	718,530	95	742,870	99
Bergen, NJ	Yes	9,124	394,140	92	424,530	99
Fairfield, CT	Yes	7,649	387,340	93	413,090	99
Bronx, NY	Yes	4,721	374,820	90	412,900	100
New Haven, CT	Yes	6,948	343,410	89	353,820	91
Essex, NJ	Yes	5,611	281,290	86	325,570	99
Hudson, NJ	Yes	2,543	244,470	93	262,640	99
Nassau, NY	Yes	11,920	201,260	33	616,330	100
Passaic, NJ	Yes	3,302	186,060	89	208,770	99
Union, NJ	Yes	4,704	181,030	76	237,010	100
Westchester, NY	Yes	9,166	141,680	33	421,720	99
Richmond, NY	Yes	2,002	97,040	51	190,220	100
Middlesex, NJ	Yes	8,014	90,710	25	358,740	99
Suffolk, NY	Yes	19,815	81,780	12	667,130	100
Morris, NJ	Yes	5,398	77,050	32	236,040	99
Monmouth, NJ	Yes	6,230	55,040	19	287,550	99
Rockland, NY	Yes	2,731	43,780	33	131,200	99
Somerset, NJ	Yes	2,702	32,080	21	148,750	99
Orange, NY	Yes	4,696	24,190	16	150,080	99
Hartford, CT	No	7,951	20,400	5	24,380	6
Sussex, NJ	No	889	17,000	23	70,640	97
Ocean, NJ	No	3,367	16,910	8	197,230	94
Putnam, NY	No	3,085	11,330	24	47,860	100
Mercer, NJ	Yes	2,668	11,130	7	150,970	93

Dutchess, NY	No	3,180	8,720	7	126,440	99
Hunterdon, NJ	No	929	8,150	13	58,450	94
Warren, NJ	Yes, Partial - Allentown- Bethlehem- Easton PA-NJ	1,342	7,160	14	26,220	52
Ulster, NY	No	2,208	2,770	3	78,640	97
Sullivan, NY	No	784	1,720	6	9,090	31

Note: The counties that are in the nonattainment area for the 1997 PM_{2.5} NAAQS are shown in boldface.

Table 10. Traffic and Commuting Patterns

The largest number of commuters to counties with violating monitors in New York and New Jersey are from Kings, Queens, and New York. The New York counties of the Bronx, Nassau, Westchester, Richmond, Suffolk, Rockland, Orange; and the New Jersey counties of Bergen, Essex, Hudson, Passaic, Union, Middlesex, Morris, Monmouth, and Somerset, have about 25,000 commuters into a violating area.

Data provided by New Jersey indicates that only 7,647 commuters from Ocean County go to New York (2,964), Bronx (115), and Union County (4,567), which reduces the impact of this factor for Ocean County on the CSA.

The New York metro area has a large amount of truck traffic. The Federal Highway Administration projection of 2020 shows an increase of annual average daily traffic, which played a role in including counties for designation. Figure 15 shows projected 2020 annual average daily truck traffic.

area and could be an appropriate county for implementing mobile-source and other emission-control strategies, thus warranting inclusion in the nonattainment area.

Table 11 below shows population, population growth, VMT and VMT growth for counties that are included in the New York metropolitan area. Counties are listed in descending order based on VMT growth between 1996 and 2005.

County	2005 Population	Percent Population Change (2000-05)	Vehicle Miles Traveled in 2005 (millions annually)	Percent VMT Growth (1996-2005)
Putnam, NY	100,528	4	3,085	347
Suffolk, NY	1,472,086	3	19,815	191
Westchester, NY	947,719	2	9,166	123
Rockland, NY	294,636	2	2,731	111
Nassau, NY	1,331,620		11,920	89
Morris, NJ	490,084	4	5,398	56
Middlesex, NJ	789,283	5	8,014	56
Greene, NY	49,559	3	811	53
Bergen, NJ	902,308	2	9,124	52
Somerset, NJ	319,830	7	2,702	39
Orange, NY	372,750	9	4,696	39
Monmouth, NJ	634,841	3	6,230	37
Ulster, NY	182,433	3	2,208	37
Columbia, NY	63,327		848	34
Delaware, NY	47,360	(1)	564	33
Sullivan, NY	76,155	3	784	33
Union, NJ	530,710	1	4,704	31
New London, CT	264,265	2	3,181	21
Dutchess, NY	294,509	5	3,180	21
New Haven, CT	844,510	2	6,948	10
Fairfield, CT	901,086	2	7,649	9
Hartford, CT	875,422	2	7,951	8
Richmond, NY	475,014	7	2,002	8
Ocean, NJ	558,170	9	3,367	5
Passaic, NJ	496,985	1	3,302	3
Warren, NJ	110,317	7	1,342	2
Essex, NJ	789,166		5,611	(1)
Queens, NY	2,256,576	1	7,839	(18)
Bronx, NY	1,364,566	2	4,721	(20)
Mercer, NJ	366,070	4	2,668	(22)
Sussex, NJ	152,726	6	889	(22)
Hudson, NJ	602,970	(1)	2,543	(37)

New York, NY	1,606,275	4	4,378	(40)
Hunterdon, NJ	130,042	6	929	(42)
Kings, NY	2,511,408	2	4,899	(57)

Note: The counties that are in the nonattainment area for the 1997 PM_{2.5} NAAQS are shown in boldface.

Table 11. Population and VMT Growth and Percent Change

In New York, the counties of the Bronx, Kings, New York, Orange, Queens, Richmond, Rockland, Suffolk, Westchester, Dutchess, Putnam, Ulster, and Sullivan all exhibited growth. New York projects that the population in the Bronx, Kings, New York, Orange, Queens, Richmond, Rockland, Suffolk, Westchester, Dutchess, and Putnam will continue to grow through 2015. In New Jersey, Middlesex, Monmouth, Hudson, Morris, Warren, Hunterdon, Sussex, and Ocean counties are experiencing growth. Somerset County is experiencing significant growth percentage-wise and in absolute numbers.

The VMT growth for Putnam, Suffolk, Westchester and Rockland more than doubled from 1996-2005. Other areas in NY that had significant VMT growth were: Orange, Dutchess, Sullivan and Ulster. In NJ, Somerset, Middlesex, Morris, Monmouth, Bergen, and Union had notable VMT growth from 1996-2005.

This factor played a role in our decision process as it showed that in most of the counties in the proposed New York City Metropolitan nonattainment area there is continued growth in both population and VMT.

Factor 6: Meteorology (weather/transport patterns)

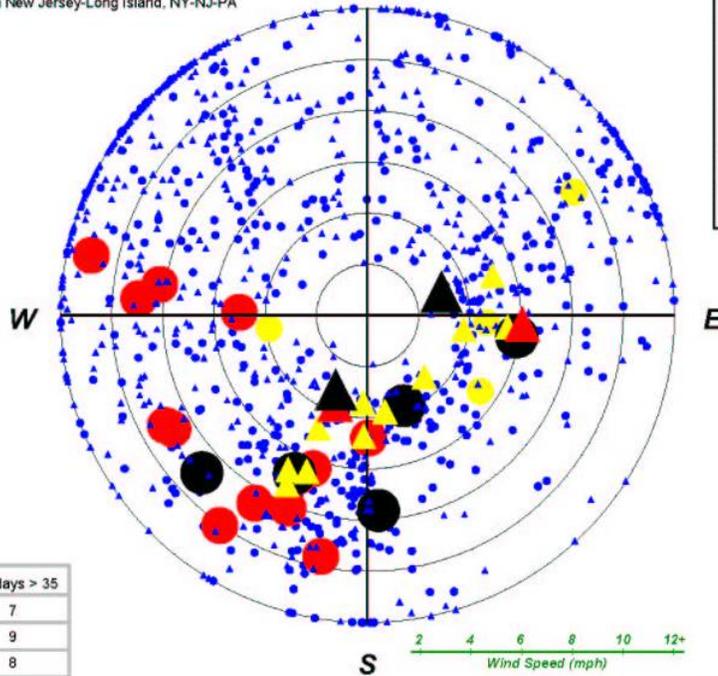
For this factor, EPA considered the most representative National Weather Service wind direction and speed data throughout the year, with an emphasis on “high PM_{2.5} days” for each of two seasons (an October-April “cold” season and a May-September “warm” season). These high days are defined as days where any FRM or FEM air-quality monitors had 24-hour PM_{2.5} concentrations above 95% on a frequency distribution curve of PM_{2.5} 24-hour values.

For each air quality monitoring site, EPA developed a “pollution rose” to understand the prevailing wind direction and wind speed on the days with highest fine particle concentrations. The figure identifies 24-hour PM_{2.5} values by color; days exceeding 35 ug/m³ are denoted with a red or black icon. A dot indicates the day occurred in the warm season; a triangle indicates the day occurred in the cool season. The center of the figure indicates the location of the air quality monitoring site, and the location of the icon in relation to the center indicates the direction from which the wind was blowing on that day. An icon that is close to the center indicates a low average wind speed on that day. Higher wind speeds are indicated when the icon is further away from the center. For this factor, EPA also considered each County’s CES, which includes an analysis of trajectories of air masses for high PM_{2.5} days. Figures 16, 17, and 18 show pollution roses for the New York Metropolitan Area.

**Bronx County, NY
Pollution Rose, 2004-2006**

Existing NAA: New York-N. New Jersey-Lon
 CSA: New York-Newark-Bridgeport, NY-NJ-CT-PA
 CBSA: New York-Northern New Jersey-Long Island, NY-NJ-PA

Site 360050110



Concentration:

- > 40 µg/m³
- 35 - 40 µg/m³
- 30 - 35 µg/m³
- ≤ 30 µg/m³

Season:

- △ cool (Oct-Apr)
- warm (May-Sep)

Year	98th %-ile	# days > 35
2004	33.9	7
2005	36.8	9
2006	36.6	8
Design Value	36-NA	

2 exceedance(s) not plotted
 (due to missing or variable wind data)

Meteorological data from 3.4 miles away
 NEW_YORK_LAGUARDIA_ARPT (ID=14732)

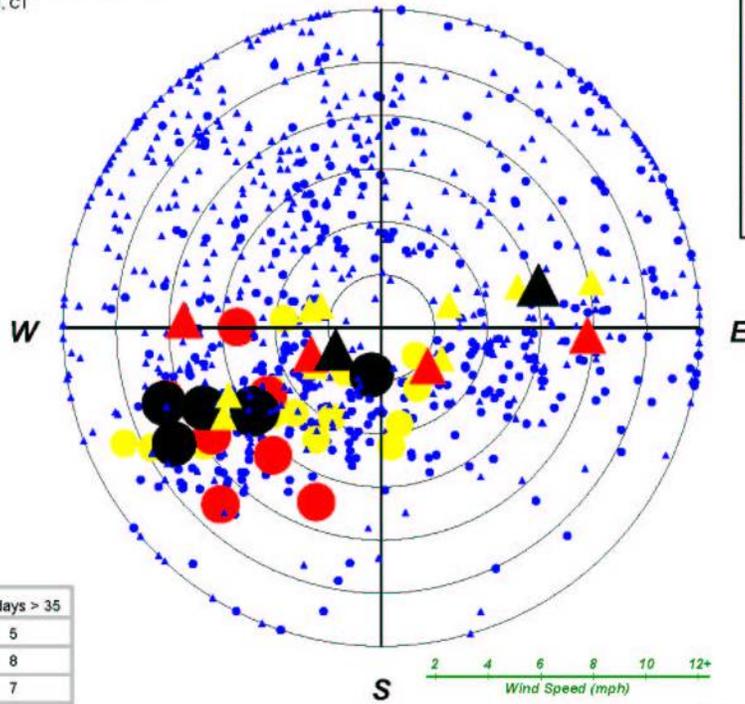
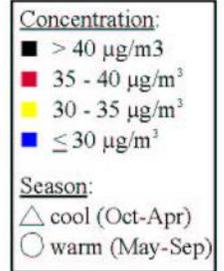
located in/near New York-N. New Jersey-Lon

Figure 16. Pollution Rose for Bronx County, NY

New Haven County, CT
Pollution Rose, 2004-2006

Existing NAA: New York-N. New Jersey-L
CSA: New York-Newark-Bridgeport, NY-NJ-CT-PA
CBSA: New Haven-Milford, CT

Site 090090027



Year	98th %-ile	# days > 35
2004	36.7	5
2005	38.2	8
2006	36.7	7
Design Value	37-NA	

All exceedances plotted

Meteorological data from 15.2 miles away
BRIDGEPORT_SIKORSKY_MEMORIAL (ID=94702)

located at near New York-N. New Jersey-Lon

Figure 17. Pollution Rose for New Haven County, CT

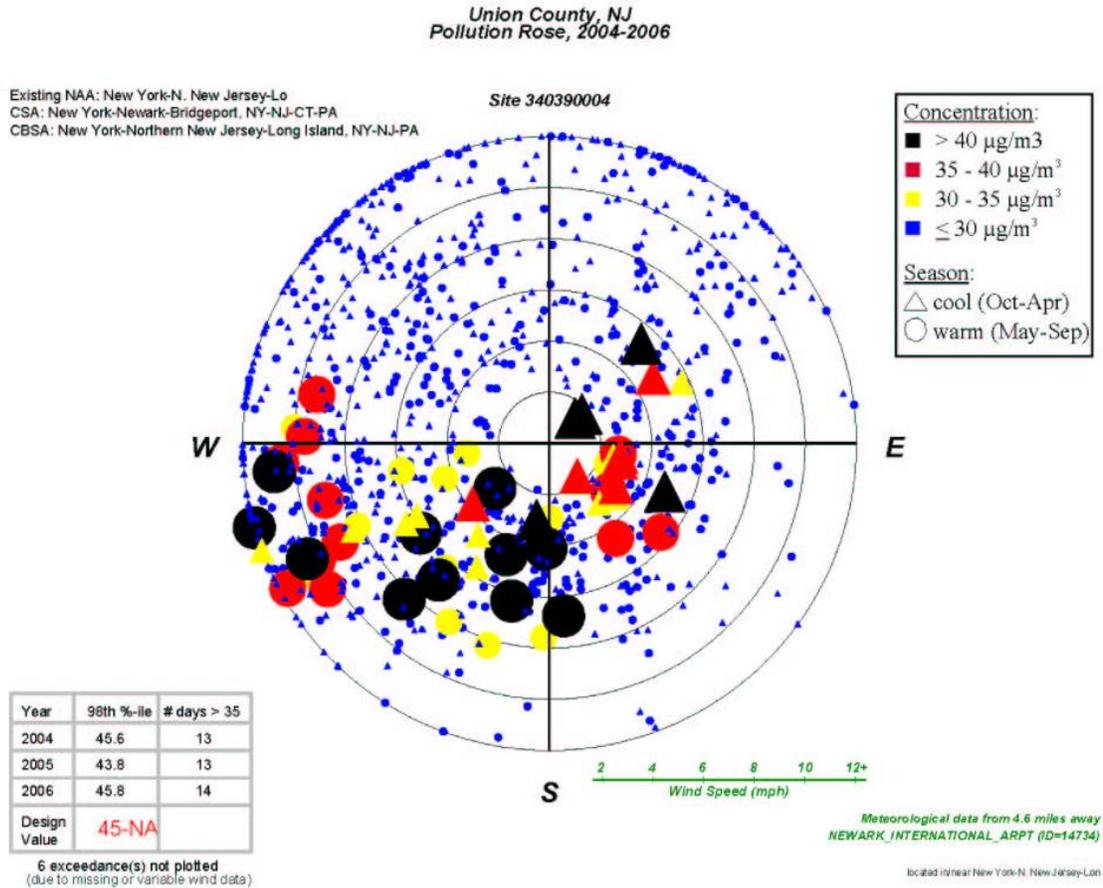


Figure 18. Pollution Rose for Union County, NJ

Generally, the analysis of prevailing wind directions and pollution roses show that the counties that are in the current 1997 $\text{PM}_{2.5}$ NAAQS nonattainment area for New York City rank high for this factor. The counties outside the 1997 $\text{PM}_{2.5}$ NAAQS nonattainment area generally ranked lower.

Table 12 shows the average prevailing surface wind directions for high $\text{PM}_{2.5}$ days by quadrant for representative counties with violating monitors in the New York City Metropolitan area. These data show that 24-hour $\text{PM}_{2.5}$ concentrations are influenced by emissions in any direction at various times, but these data also suggest that emissions in some directions relative to the violation are more likely to contribute than emissions in other directions.

County	Prevailing Wind Direction (%)			
	NW	SW	SE	NE

Union County, NJ	9%	61%	22%	8%
Bronx County, NY	11%	49%	31%	9%
New Haven County, CT	8%	60%	25%	7%

Table 12. Prevailing Wind Directions for High PM_{2.5} Days

EPA’s analysis of meteorology shows that PM_{2.5} emissions during high PM_{2.5} days in 2004-2006 primarily originated and/or passed through locations from a southerly to a southwesterly direction. This is also evident upon examination of the pollution roses (see Figures 12, 13, and 14) for the New York City Metropolitan area. In addition, the pollution roses also show that some component of elevated PM_{2.5} measured at the nonattainment monitors may originate from a northerly direction. The roses, therefore, show the need to consider the contribution of all surrounding counties to the violating monitors in the New York City Metropolitan area. This ensures that the nonattainment area is sufficiently large enough to include both the areas that violate and the areas that contribute.

In New York State, the Counties that ranked high for this factor are Queens, Bronx, Richmond, Nassau, Kings, New York, Rockland, Westchester, and Orange. Suffolk County ranked slightly lower for this factor.

Ulster and Dutchess Counties were not shown to contribute significantly based on the analysis of meteorology. Ulster County is north to northwest of violating monitors in New York, New Jersey and Connecticut. Pollution roses and the prevailing wind direction did not indicate a high impact from this area. The CES score was very low (i.e. 3 on a scale of 100). Dutchess County is northwest of violating monitors in Connecticut, and northeast of violating monitors in New York and New Jersey. Pollution roses and the prevailing wind direction did not indicate a high impact from this area either.

In New Jersey, the Counties that rank high for this factor are Union, Bergen, Essex, Hudson, Mercer, Middlesex, Monmouth, Morris, Passaic, and Somerset Counties.

Ocean County is generally south of violating monitors in New Jersey and New York, and southwest of violating monitors in CT. The Ocean County CES score was very low (6), and pollution roses did not indicate a high impact from Ocean County to areas that violate.

Based on our analysis, this factor supports including the Counties of New York, Bronx, Queens, Kings, Richmond, Nassau, Suffolk, Westchester, Orange, and Rockland Counties in New York; and Union, Bergen, Essex, Hudson, Mercer, Middlesex, Monmouth, Morris, Passaic, and Somerset in New Jersey in the New York City metropolitan nonattainment area.

Note: the meteorology factor is also considered in each county’s Contributing Emissions Score because the method for deriving this metric included an analysis of trajectories of air masses for high PM_{2.5} days.

Factor 7: Geography/topography (mountain ranges or other air basin boundaries)

The geography/topography analysis looks at physical features of the land that might have an effect on the air shed and, therefore, on the distribution of PM_{2.5} over the New York metropolitan area.

The New York City Metropolitan area does not have any geographical or topographical barriers significantly limiting air-pollution transport within its air shed. Therefore, this factor did not play a significant role in the decision-making process.

Factor 8: Jurisdictional boundaries (e.g., existing PM and ozone areas)

In evaluating the jurisdictional boundary factor, consideration should be given to existing boundaries and organizations that may facilitate air quality planning and the implementation of control measures to attain the standard. Areas designated as nonattainment (e.g. for PM_{2.5} or 8-hour ozone standard) represent important boundaries for state air quality planning.

The major jurisdictional boundary in the New York City Metropolitan nonattainment area are the State lines between New York, New Jersey, and Connecticut.

All counties in New Jersey were designated nonattainment for the 8-hour ozone standard on April 15, 2004. Ocean and Mercer Counties in New Jersey were associated with an ozone nonattainment area, but this was a separate and distinct area from the other counties in the New York metropolitan area. All New York counties that are candidates for a 24-hour PM_{2.5} nonattainment designation in the New York metropolitan area were designated nonattainment for the 8-hour ozone standard, with the exception of Putnam, Sullivan, and Ulster counties. Orange and Dutchess Counties were also associated with a different ozone nonattainment area.

In EPA's June 2007 Guidance for Area Designations for the 24-HR PM_{2.5} NAAQS, EPA had indicated that we expected that the boundaries for the existing 1997 PM_{2.5} nonattainment areas would have been appropriate for the boundaries of the new nonattainment areas for the 2006 PM_{2.5} NAAQS. The following counties were included in the EPA Region 2 portion of the 1997 PM_{2.5} NAAQS nonattainment area for the New York City metropolitan area: New York, Bronx, Queens, Kings, Richmond, Nassau, Suffolk, Westchester, Orange, and Rockland Counties in New York; and Union, Bergen, Essex, Hudson, Mercer, Middlesex, Monmouth, Morris, Passaic, and Somerset Counties in New Jersey. Dutchess and Ulster Counties in New York; and Ocean County in New Jersey were not included in the 1997 PM_{2.5} NAAQS nonattainment area for the New York City metropolitan area.

Factor 9: Level of control of emission sources

This factor considers emission controls currently implemented in the New York City Metropolitan area. This factor analysis generally considered the emissions controls currently in place.

The emission estimates on Table 7 (under Factor 1) include any control strategies implemented by the States in the New York City Metropolitan area before 2005 that may influence emissions of any component of PM_{2.5} emissions (i.e., total carbon, SO₂, NO_x, and crustal PM_{2.5}). Since we believe that the emissions listed in Table 7 have not changed significantly since 2005, this factor does not influence heavily in our decision-making.

In considering county-level emissions, EPA considered 2005 emissions data from the National Emissions Inventory. EPA recognizes that certain power plants or large sources of emissions in this potential nonattainment area may have installed emission controls or otherwise significantly reduced emissions since 2005 and that this information may not be reflected in this analysis. EPA will consider additional information on emission controls in making final designation decisions. In cases where specific plants already have installed emission controls or plan to install such controls in the near future, EPA requests additional information on:

- the plant name, city, county, and township/tax district
- identification of emission units at the plant, fuel use, and megawatt capacity
- identification of emission units on which controls will be installed, and units on which controls will not be installed
- identification of the type of emission control that has been or will be installed on each unit, the date on which the control device became / will become operational, and the emission reduction efficiency of the control device
- the estimated pollutant emissions for each unit before and after implementation of emission controls
- whether the requirement to operate the emission control device will be federally enforceable by December 2008, and the instrument by which federal enforceability will be ensured (e.g. through source-specific SIP revision, operating permit requirement, consent decree)

EPA Technical Analysis for the Philadelphia-Wilmington, PA-NJ-DE area

Discussion

Pursuant to section 107(d) of the Clean Air Act, EPA must designate as nonattainment those areas that violate the NAAQS and those areas that contribute to violations. This technical analysis for the New Jersey portion of the Philadelphia-Wilmington, PA-NJ-DE (Philadelphia Metropolitan) area identifies the counties with monitors that violate the 24-hour PM_{2.5} standard and evaluates the counties that potentially contribute to fine particle concentrations in the area. EPA has evaluated these counties based on the weight of evidence of the following nine factors recommended in EPA guidance and any other relevant information:

- pollutant emissions
- air quality data
- population density and degree of urbanization
- traffic and commuting patterns
- growth
- meteorology
- geography and topography
- jurisdictional boundaries
- level of control of emissions sources

Figure 19 is a map of the counties in the area and other relevant information such as the locations and design values of air quality monitors, the metropolitan area boundary, and counties recommended as nonattainment by the State.

Philadelphia-Wilmington, PA-NJ-DE

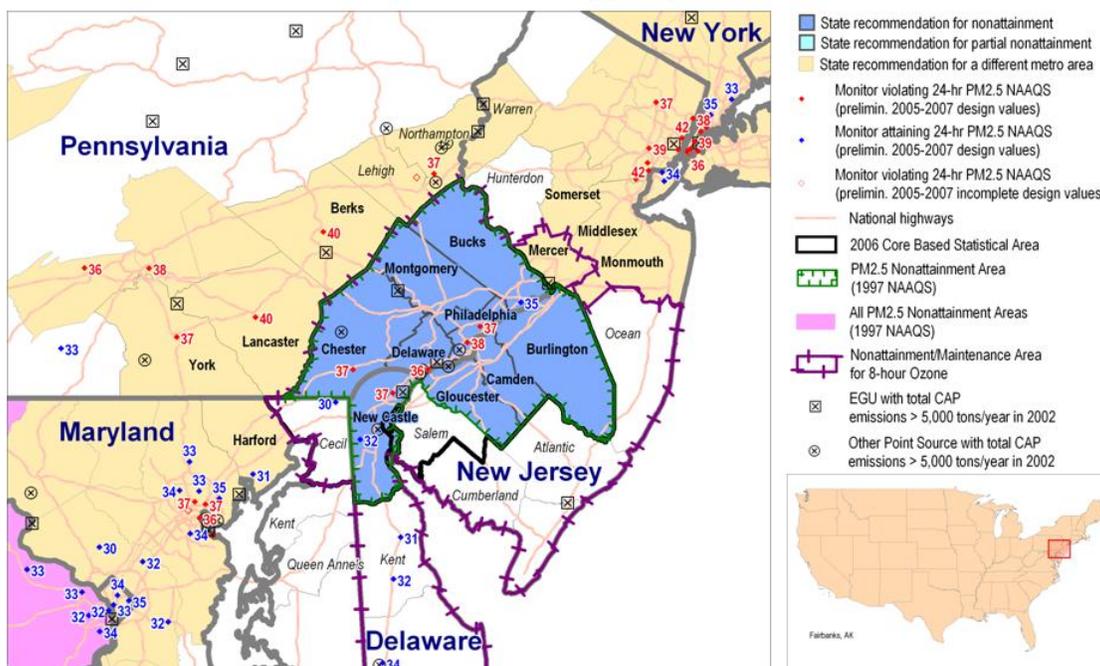


Figure 19. Philadelphia Metropolitan area

For this area, EPA previously established PM_{2.5} nonattainment boundaries for the 1997 PM_{2.5} NAAQS that included three full counties located in New Jersey.

In the state's December 2007 letter to EPA, New Jersey recommended that the same counties be designated as "nonattainment" for the 2006 24-hour PM_{2.5} standard based on air quality data from 2004-2006. These data are from Federal Reference Method (FRM) monitors located in the state.

Air quality monitoring data on the composition of fine particle mass are available from the EPA Chemical Speciation Network and the IMPROVE monitoring network. Analysis of these data indicates that the days with the highest fine particle concentrations occur in the warm season. The PM_{2.5} urban increment as noted in the below figures is dominated by total carbon in both the warm and cold season months (i.e. 56 percent in the warm season, and 50 percent in the cold season), and sulfates (i.e. 41 percent in the warm, and 27 percent in the cold seasons). Nitrate was measured at three percent in the warm season, and twelve percent in the cold season. Crustal components were insignificant in the warm season (0%) and were measured at 11% in the cold season as noted in the above figures.

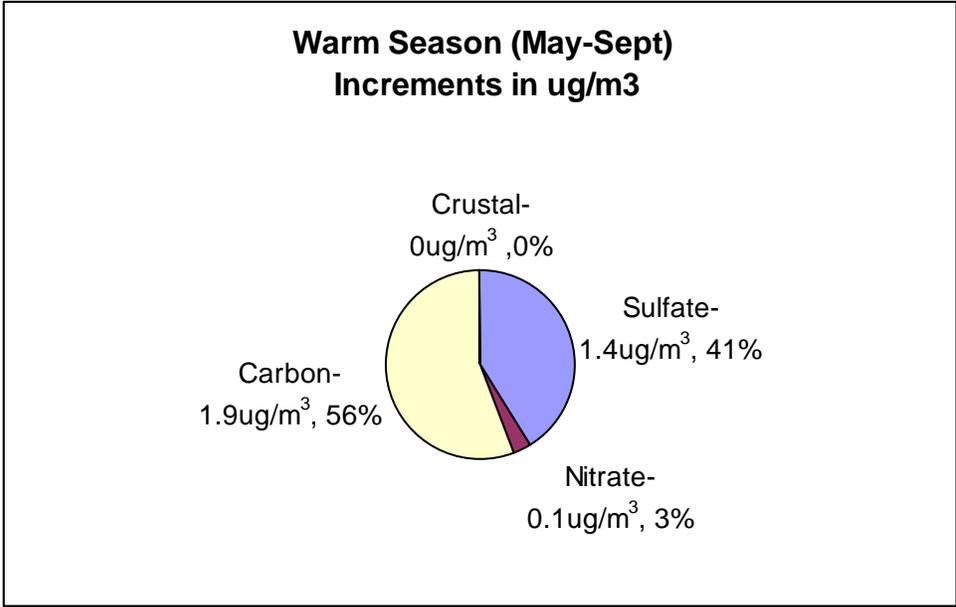


Figure 20. PM_{2.5} Compositional Analysis of Warm Season Urban Increment for the Philadelphia Metropolitan area. Total Urban Increment = 3.4 ug/m³

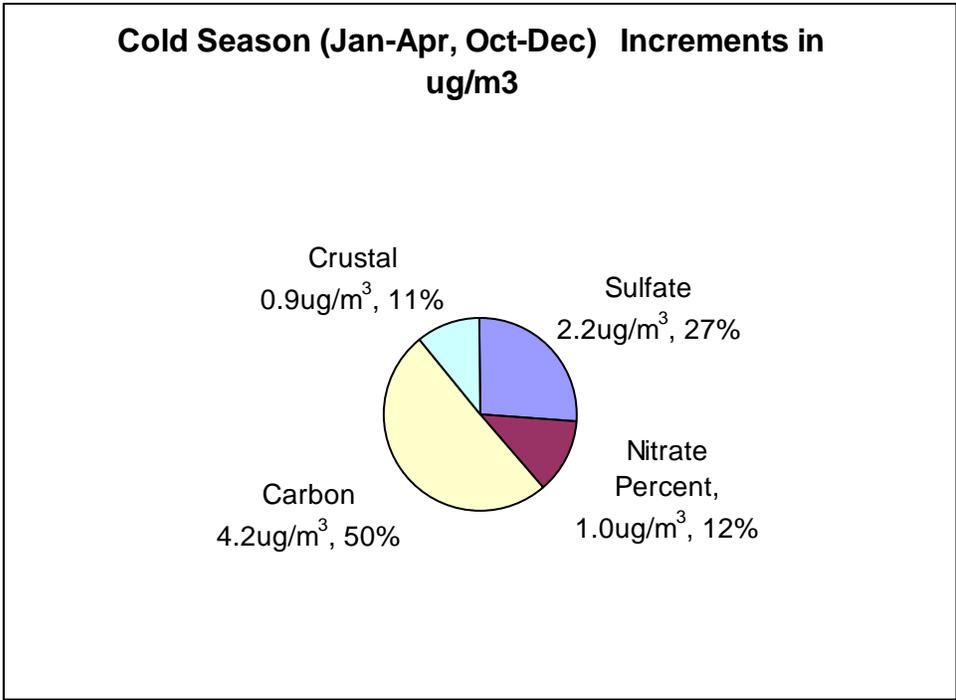


Figure 21. PM_{2.5} Compositional Analysis of Cold Season Urban Increment for the Philadelphia Metropolitan area. Total Urban Increment = 8.3 ug/m³

Based on EPA's 9-factor analysis described below, EPA believes that the same counties as previously designated for PM_{2.5} should be designated nonattainment for the 24-hour PM_{2.5} air-quality standard as part of the for the Philadelphia Metropolitan area

nonattainment area, based upon currently available information. These counties are listed in the table below.

Philadelphia Metropolitan nonattainment area	State-Recommended Nonattainment Counties	EPA-Proposed Nonattainment Counties
New Jersey	Burlington County, Camden County, and Gloucester County	No Change

The following is a summary of the 9-factor analysis for the EPA Region 2 portion of the Philadelphia Metropolitan area.

EPA is proposing attainment/ unclassifiable for Warren, Hunterdon, Salem, Cumberland, and Atlantic counties. Warren, Hunterdon, and Cumberland counties had low emissions, low Contributing Emission Scores (CES), low population, low commuting numbers, low growth, and low meteorological and geographical impact which indicates minimal contribution to violating monitors in the Philadelphia Metropolitan area. Salem and Atlantic have moderate emissions but all other factors are low. All of the counties which EPA is proposing as attainment/unclassifiable do not have any violating ambient air quality monitors.

EPA is proposing nonattainment for Camden, Gloucester, and Burlington Counties. Camden County has a violating monitor. Burlington, and Gloucester counties have been determined to contribute based on traffic and commuting, emissions, and location and density of their populations.

Factor 1: Emissions data

For this factor, EPA evaluated county level emission data for the following PM_{2.5} components and precursor pollutants: “PM_{2.5} emissions total,” “PM_{2.5} emissions carbon,” “PM_{2.5} emissions other,” “SO₂,” and “NO_x”. “PM_{2.5} emissions total” represents direct emissions of PM_{2.5} and includes: “PM_{2.5} emissions carbon,” “PM_{2.5} emissions other”, primary sulfate (SO₄), and primary nitrate. (Although primary sulfate and primary nitrate, which are emitted directly from stacks rather than forming in atmospheric reactions with SO₂ and NO_x, are part of “PM_{2.5} emissions total,” they are not shown in table 13 as separate items). “PM_{2.5} emissions carbon” represents the sum of organic carbon (OC) and elemental carbon (EC) emissions, and “PM_{2.5} emissions other” represents other inorganic particles (crustal). Emissions of SO₂ and NO_x, which are precursors of the secondary PM_{2.5} components sulfate and nitrate, are also considered.

Emissions data were derived from the 2005 National Emissions Inventory (NEI), version 1. See http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html.

EPA also considered the Contributing Emissions Score (CES) for each county. The CES is a metric that takes into consideration emissions data, meteorological data, and air quality monitoring information to provide a relative ranking of counties in and near an area. Note that this metric is not the exclusive way for consideration of data for these factors. A summary of the CES is included in attachment 2, and a more detailed description can be found at http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html#C.

Table 13 shows emissions of PM_{2.5} and precursor pollutants components (given in tons per year) and the CES for violating and potentially contributing counties in the Philadelphia Metropolitan area. Counties are listed in descending order by CES. The counties that are currently designated nonattainment area for the 1997 PM_{2.5} NAAQS are shown in boldface.

County	State Recommended Nonattainment ?	CES	PM _{2.5} emissions total (tpy)	PM _{2.5} emissions carbon (tpy)	PM _{2.5} emissions other (tpy)	SO ₂ (tpy)	NO _x (tpy)
New Castle, DE	Yes	100	2,394	891	1,504	50,955	28,291
Philadelphia, PA	Yes	100	2,506	1,248	1,258	11,293	38,733
Delaware, PA	Yes	89	2,454	865	1,589	20,356	32,904
Gloucester, NJ	Yes	85	1,607	677	930	7,116	12,711
Camden, NJ	Yes	68	971	597	374	1,839	13,852
Burlington, NJ	Yes	32	1,960	1,137	822	3,368	15,570
Chester, PA	Yes	26	2,124	799	1,325	7,990	16,507
Montgomery, PA	Yes	24	2,597	1,118	1,477	5,411	23,306
Bucks, PA	Yes	11	2,022	876	1,146	3,951	16,792
York, PA	Yes- other	33	7,614	1,217	6,396	118,621	32,214
Salem, NJ	No	28	1,233	314	919	5,947	7,241
Atlantic, NJ	No	14	1,664	1,045	619	752	7,310
Cecil, MD	No	13	870	446	425	1,298	3,962
Cumberland, NJ	No	12	952	440	513	3,196	6,526
Lancaster, PA	Yes	11	3,258	1,159	2,099	4,017	16,396
Mercer, NJ	Yes	10	1,658	579	1,079	17,891	17,640
Berks, PA	Yes	9	3,378	922	2,456	18,874	18,086
Harford, MD	Yes	9	1,769	879	890	2,307	7,310
Kent, DE	No	7	1,014	435	580	4,478	9,088
Ocean, NJ	No	5	1,540	993	547	1,060	9,578
Northampton, PA	Yes- other	4	5,222	665	4,556	60,396	24,620

Middlesex, NJ	Yes- other	3	1,549	951	598	3,129	29,172
Kent, MD		2	443	162	282	471	1,002
Lehigh, PA	Yes	2	1,328	501	828	3,749	11,503
Monmouth, NJ	Yes	2	1,506	989	517	1,789	16,771
Queen Anne's, MD	No	2	659	261	398	479	2,076
Hunterdon, NJ	No	1	769	454	316	556	3,882
Somerset, NJ	Yes	1	801	451	349	577	7,886
Warren, NJ	Yes	0	1,105	588	517	563	5,088

Table 13. PM_{2.5} Related Emissions and Contributing Emissions Score

In the New Jersey portion of the Philadelphia Metropolitan Area the counties with relatively high emissions compared to the remainder of the area are Burlington, Mercer, and Monmouth Counties. Gloucester, Camden, Atlantic, and Ocean Counties were mid-range when compared to the other counties in the Philadelphia Metropolitan area. Salem was moderate for SO₂, but was low for carbon and NO_x. Cumberland, Hunterdon, and Warren Counties had low emissions when compared to other potentially contributing counties in the area.

As New Jersey pointed out in their analysis, Gloucester, Camden, Burlington, and Salem Counties in New Jersey have multiple large point sources which are concentrated along the border of Philadelphia and Delaware Counties in Pennsylvania, and New Castle, Delaware. Figure 22 shows the New Jersey point sources concentrated along that area.

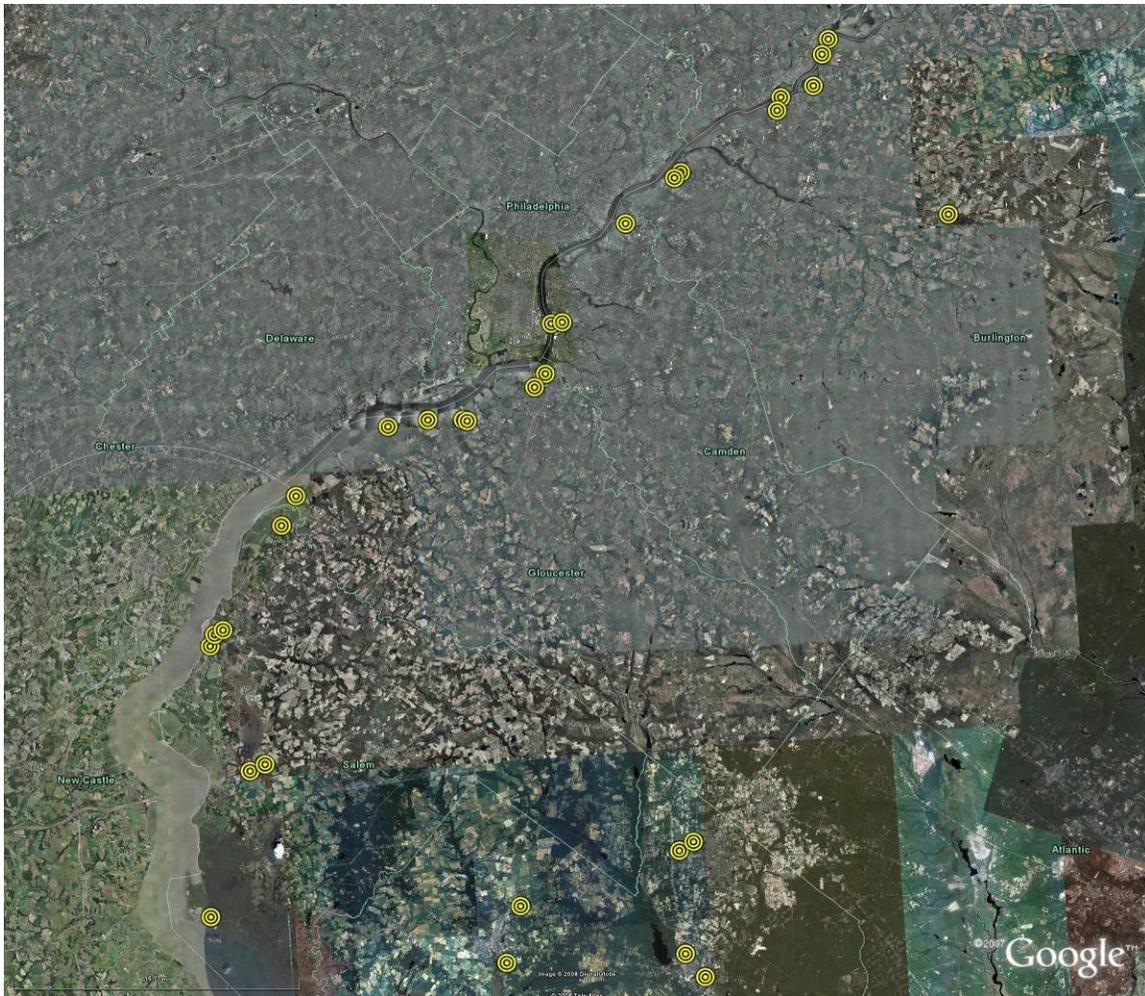


Figure 22. New Jersey Point Sources (50 tpy or more) along the Philadelphia, PA and New Castle, DE borders

CES values were generally inconsistent with elevated emissions levels, which was an indication of low impact of elevated emissions on counties with violating monitors. CES scores were high for Gloucester, and Camden, but were lower for the remaining New Jersey counties. CES scores were very low for Ocean (i.e. 5 on a scale of 100), Monmouth (2), Hunterdon (1), and Warren (0) Counties, which is indicative of minimal contribution.

Hunterdon, NJ emissions account for slightly over one percent (i.e. 769 tons) of the total $PM_{2.5}$ emissions, two percent of the carbon emissions (i.e. 454 tons), and less than one percent of the total SO_2 emissions (i.e. 556 tons) and NO_x emissions (i.e. 3,882 tons) for the area. Crustal components were also low at 316 tons, which represented less than one percent.

Warren County, NJ also has relatively lower emissions than most of the other counties in the area. 2005 total $PM_{2.5}$ and carbon emissions were 1,105 tons and 588 tons, respectively, which represents about two percent of the total $PM_{2.5}$ and two and a half percent of the carbon emissions for the area under consideration. SO_2 emissions (i.e. 563

tons) were below a half a percent, and NO_x emissions (i.e. 5,088 tons) were slightly above one percent of the areas emissions. Crustal components were also low at 517 tons, which represented one and a half percent of emissions.

In their December 2007 recommendation to EPA, New Jersey used 2002 emissions and projected 2009 emissions from the 2002 MANE-VU Modeling Inventory. New Jersey also showed relatively lower emissions from Hunterdon and Warren Counties than the other counties in the area.

Monmouth, Middlesex and Mercer counties have been recommended for inclusion in the Northern New Jersey-Long Island, NY-NJ-CT (New York City metropolitan) nonattainment area. Monmouth, Middlesex and Mercer Counties have been included in the New York City metropolitan area for the current 1997 PM_{2.5} standard and EPA believes that it is appropriate to keep the counties in the current nonattainment area (see Factor 7).

Camden, Gloucester, Burlington, Cumberland, Atlantic, Salem, and Ocean counties are candidates for a 24-hour PM_{2.5} nonattainment designation.

Factor 2: Air quality data

This factor considers the 24-hour PM_{2.5} design values (in µg/m³) for air quality monitors in counties in the Philadelphia Metropolitan area based on data for the 2005-2007 period. A monitor’s design value indicates whether that monitor attains a specified air quality standard. The 24-hour PM_{2.5} standards are met when the 3-year average of a monitor’s 98th percentile values are 35 µg/m³ or less. A design value is only valid if minimum data completeness criteria are met.

The 24-hour PM_{2.5} design values for counties in the Philadelphia Metropolitan area are shown in Table 14.

County	State Recommended Nonattainment	Design Values 2005-07 (µg/m ³)
New Castle, DE	Yes	37
Philadelphia, PA	Yes	38
Delaware, PA	Yes	36
Gloucester, NJ	Yes	28.5*
Camden, NJ	Yes	38
Burlington, NJ	Yes	No monitor
Chester, PA	Yes	37

Montgomery, PA	Yes	No monitor
	Yes	35
Bucks, PA		
York, PA	Yes- other	37
Salem, NJ	No	No monitor
Atlantic, NJ	No	30.1*
Cecil, MD	No	30
Cumberland, NJ	No	No monitor
Lancaster, PA	Yes	40
Mercer, NJ	Yes	34
Berks, PA	Yes- other	40
Harford, MD	Yes- other	31
Kent, DE	No	32
Ocean, NJ	No	31*
Northampton, PA	Yes- other	37
Middlesex, NJ	Yes- other	34*
Kent, MD		No monitor
Lehigh, PA	Yes	No monitor
Monmouth, NJ	Yes	No monitor
Queen Anne's, MD	No	No monitor
Hunterdon, NJ	No	No monitor
Somerset, NJ	Yes- other	No monitor
Warren, NJ	Yes- other	34

* Data is from 2004-2006. 2005-2007 data was not available.

Table 14. Air Quality Data

The only violating county in the New Jersey portion of the Philadelphia Metropolitan area is Camden, NJ. Philadelphia, Delaware, and Chester Counties in Pennsylvania; and New Castle County, DE also violate the 24-hour PM_{2.5} standard, however these additional counties in the Philadelphia Metropolitan area, and other counties not in New Jersey, that violate the PM_{2.5} NAAQS, are not discussed here in EPA Region 2's analysis.

Warren, Atlantic, Gloucester, and Ocean counties have monitors meeting the 24-hour PM_{2.5} standard. Burlington, Cumberland, Hunterdon, and Salem counties do not have monitors.

Note: Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) at population-oriented locations with a FRM or FEM monitor. All data from Special Purpose Monitors (SPM) using an FRM, FEM, or Alternative Reference Method (ARM) which has operated for more than 24 months is eligible for comparison to the relevant NAAQS, subject to the requirements given in the October 17, 2006 Revision to Ambient Air Monitoring Regulations (71 FR 61236). All monitors used to provide data must meet the monitor siting and eligibility requirements given in 71 FR 61236 to 61328 in order to be acceptable for comparison to the 24-hr PM_{2.5} NAAQS for designation purposes.

Factor 3: Population density and degree of urbanization (including commercial development)

Table 15 shows the 2005 population for each county in the area being evaluated, as well as the population density for each county in that area. Population data give an indication of whether it is likely that population-based emissions might contribute to violations of the 24-hour PM_{2.5} standards. Table 15 is sorted by 2005 population.

County	State Recommended Nonattainment	2005 Population	2005 Population Density (pop/sq mi)
Philadelphia, PA	Yes	1,456,350	10220
Middlesex, NJ	Yes-Other	789,283	2487
Montgomery, PA	Yes	774,666	1591
Monmouth, NJ	Yes-Other	634,841	1308
Bucks, PA	Yes	619,772	998
Ocean, NJ	No	558,170	738
Delaware, PA	Yes	554,393	2910
New Castle, DE	Yes	522,094	1077
Camden, NJ	Yes	515,381	2272
Lancaster, PA	Yes-Other	489,936	499
Chester, PA	Yes	473,723	624
Burlington, NJ	Yes	449,148	548
York, PA	Yes-Other	408,182	449
Berks, PA	Yes-Other	396,236	458

Mercer, NJ	Yes-Other	366,070	1601
Lehigh, PA	Yes-Other	330,168	948
Somerset, NJ	Yes-Other	319,830	1049
Northampton, PA	Yes-Other	287,334	762
Gloucester, NJ	Yes	277,037	823
Atlantic, NJ	No	270,318	444
Harford, MD	Yes-Other	238,850	519
Cumberland, NJ	No	152,905	304
Kent, DE	No	143,462	240
Hunterdon, NJ	No	130,042	297
Warren, NJ	Yes-Other	110,317	305
Cecil, MD	No	97,474	257
Salem, NJ	No	66,054	190
Queen Anne's, MD	No	45,469	115
Kent, MD	No	19,908	67

Note: The counties that are currently designated nonattainment for the 1997 PM_{2.5} NAAQS are shown in boldface.

Table 15. Population

Philadelphia is the most highly populated and dense county in the area and overshadows other counties in the area. Camden County has high population density and is relatively more urbanized than other NJ counties in the area. The population of Gloucester, Camden, and Burlington are concentrated along the border of Philadelphia and Delaware counties.

The population of Ocean County is mainly concentrated in the northeastern portion of the county, which makes Ocean County's population impact on the Philadelphia Metropolitan area minimal. Warren, Hunterdon, Atlantic, Cumberland, and Salem counties have low populations and population densities in comparison to the Philadelphia and Camden.

The location and density of populations played a role in decision making for the counties of Camden, Gloucester, and Burlington, as they are high and/or located near Philadelphia.

Factor 4: Traffic and commuting patterns

This factor considers the number of commuters in each county who drive to another County within the Philadelphia Metropolitan area, the percent of total commuters in each County who commute to violating counties within the Philadelphia Metropolitan area, as well as the total Vehicle Miles Traveled (VMT) for each county in millions of miles annually (see Table 16). A county with numerous commuters is generally an integral part of an urban area and is likely contributing to fine particle concentrations in the area.

County	State Recommended Non-attainment?	2005 VMT (million mi)	Number Commuting to any violating counties	Percent Commuting to any violating counties	Number Commuting into statistical area	Percent Commuting into statistical area
Philadelphia, PA	Yes	6,499	469,300	82	558,270	98
New Castle, DE	Yes	5,674	228,630	93	237,010	97
Lancaster, PA	Yes-Other	4,392	217,820	94	9,110	4
Delaware, PA	Yes	4,011	216,560	85	249,130	98
Chester, PA	Yes	4,414	184,920	85	207,990	96
Camden, NJ	Yes	4,669	162,290	71	215,780	94
Berks, PA	Yes-Other	3,320	159,000	90	20,450	12
York, PA	Yes-Other	3,333	148,290	77	730	0
Lehigh, PA	Yes-Other	3,374	133,030	90	10,210	7
Montgomery, PA	Yes	7,527	101,460	27	365,750	96
Northampton, PA	Yes-Other	2,399	99,860	80	3,730	3
Burlington, NJ	Yes	4,902	46,850	23	174,000	84
Bucks, PA	Yes	5,250	44,390	15	261,390	86
Gloucester, NJ	Yes	2,621	42,160	35	111,620	92
Cecil, MD	No	1,193	15,970	38	34,590	83
Kent, DE	No	1,435	6,370	11	6,710	11
Salem, NJ	No	1,013	5,450	19	24,900	87
Atlantic, NJ	No	3,234	4,700	4	8,310	7
Mercer, NJ	Yes-Other	2,668	2,700	2	11,100	7

Warren, NJ	Yes-Other	1,342	2,450	5	230	1
Cumberland, NJ	No	1,264	2,020	4	6,820	12
Harford, MD	Yes-Other	2,068	1,920	2	3,030	3
Ocean, NJ	No	3,367	1,460	1	5,520	3
Monmouth, NJ	Yes-Other	6,230	1,190	0	2,410	1
Middlesex, NJ	Yes-Other	8,014	970	0	2,250	1
Hunterdon, NJ	No	929	840	1	1,710	3
Kent, MD	No	219	680	8	970	11
Somerset, NJ	Yes-Other	2,702	450	0	1,050	1
Queen Anne's, MD	No	758	230	1	260	1

Note: The counties that are currently designated nonattainment for the 1997 PM_{2.5} NAAQS are shown in boldface.

Table 16. Traffic and Commuting Patterns

The listing of counties on Table 16 reflects a ranking based on the number of people commuting to any violating county.

The largest numbers of commuters come from Pennsylvania and Delaware. Camden, Gloucester, and Burlington each have over 100,000 commuters into the statistical area. Warren, Hunterdon, Salem, Cumberland, Ocean, and Atlantic Counties each have less than 25,000 commuters into the statistical area and less than 5,500 commuters into any violating area. New Jersey provided information in their recommendation showing that Camden, Gloucester, and Burlington each have over 10,000 commuters into Philadelphia, which is approximately 10 times more than other southern NJ counties. VMT, number of commuters into the statistical area, and violating area, for Camden, Gloucester, and Burlington, played a role in our decision making process.

The Philadelphia area has a large amount of truck traffic. The Federal Highway Administration projection of 2020 (Figure 23) shows an increase in the annual average daily truck traffic through Camden, Gloucester, and Burlington, which played a role in including counties for designation. Warren, Hunterdon, and Salem County are projected to have increased truck traffic. Atlantic, Ocean, and Cumberland counties are projected to have lower increases in truck traffic. The projected increase for all of the counties considered was not significant enough to play a role in the designation of the counties.

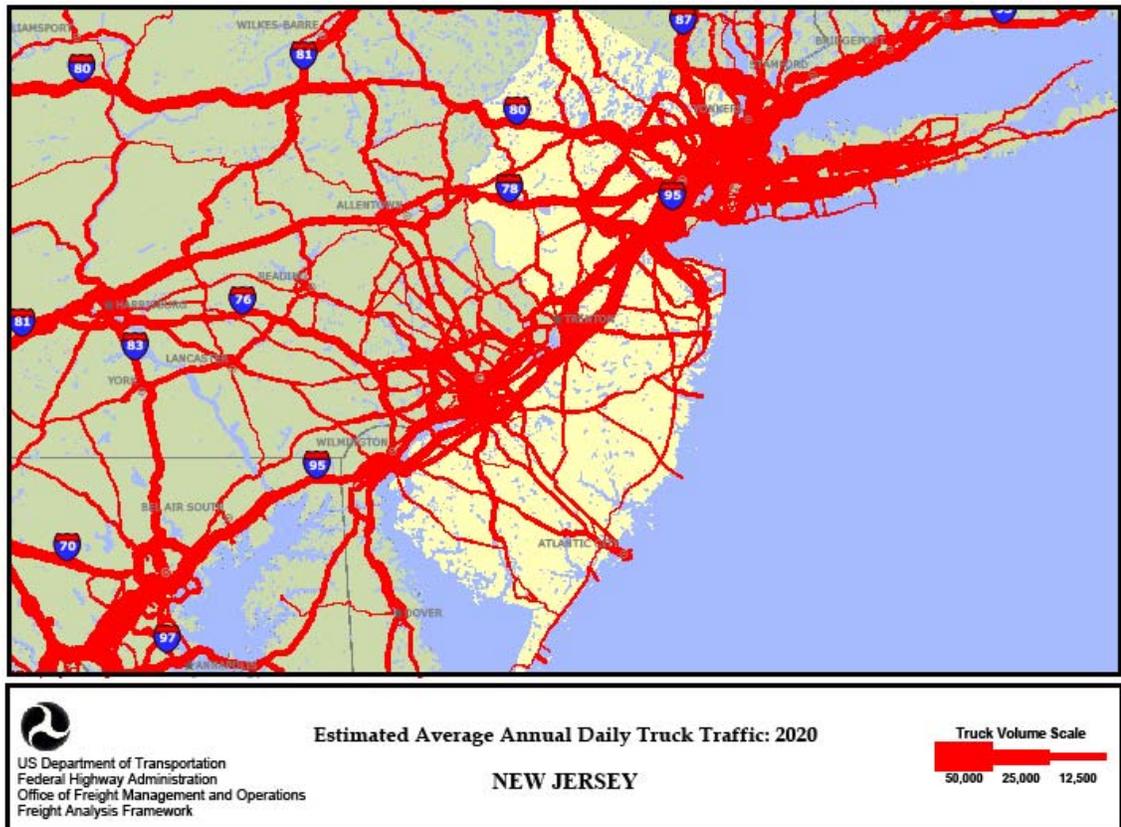


Figure 23. Estimated Average Annual Daily Truck Traffic in 2020

Note: The 2005 VMT data used for Table 16 and 17 of the 9-factor analysis has been derived using methodology similar to that described in “Documentation for the final 2002 Mobile National Emissions Inventory, Version 3, September 2007, prepared for the Emission Inventory Group, U.S. EPA. This document may be found at: [atftp://ftp.epa.gov/EmisInventory/2002finalnei/documentation/mobile/2002_mobile_nei_version_3_report_092807.pdf](http://ftp.epa.gov/EmisInventory/2002finalnei/documentation/mobile/2002_mobile_nei_version_3_report_092807.pdf)

The 2005 VMT data were taken from documentation which is still draft, but which should be released in 2008.

Factor 5: Growth rates and patterns

This factor looks at population (2005), expected population change (2000-2005), VMT (2005), and VMT growth (1996-2005) for Counties in the Philadelphia Metropolitan area. A county with rapid population or VMT growth is generally an integral part of an urban area and could be an appropriate county for implementing mobile-source and other emission-control strategies, thus warranting inclusion in the nonattainment area.

Table 17 below shows population, population growth, VMT and VMT growth for counties that are included in the Philadelphia Metropolitan area. Counties are listed in descending order based on VMT growth between 1996 and 2005.

County	2005 Population	Percent Population Change (2000-05)	Vehicle Miles Traveled in 2005 (millions annually)	Percent VMT Growth (1996-2005)
Queen Anne's, MD	45,469	11	758	81
Montgomery, PA	774,666	3	7,527	73
Middlesex, NJ	789,283	5	8,014	56
Chester, PA	473,723	9	4,414	54
Atlantic, NJ	270,318	7	3,234	54
Salem, NJ	66,054	3	1,013	50
Bucks, PA	619,772	3	5,250	49
Burlington, NJ	449,148	6	4,902	43
Kent, MD	19,908	3	219	42
Somerset, NJ	319,830	7	2,702	39
Monmouth, NJ	634,841	3	6,230	37
Lehigh, PA	330,168	6	3,374	34
Gloucester, NJ	277,037	8	2,621	26
New Castle, DE	522,094	4	5,674	25
Cumberland, NJ	152,905	4	1,264	24
Delaware, PA	554,393	0	4,011	24
Northampton, PA	287,334	7	2,399	21
Lancaster, PA	489,936	4	4,392	21
Camden, NJ	515,381	1	4,669	17
Berks, PA	396,236	6	3,320	11
Cecil, MD	97,474	13	1,193	10
York, PA	408,182	7	3,333	6
Kent, DE	143,462	13	1,435	5
Ocean, NJ	558,170	9	3,367	5
Warren, NJ	110,317	7	1,342	2
Harford, MD	238,850	9	2,068	0
Mercer, NJ	366,070	4	2,668	-22
Philadelphia, PA	1,456,350	-4	6,499	-31
Hunterdon, NJ	130,042	6	929	-42

Note: The counties that are currently designated nonattainment for the 1997 PM_{2.5} NAAQS are shown in boldface.

Table 17. Population and VMT Growth and Percent Change.

The population of Philadelphia is by far the largest in the area. The population growth for Camden, Cumberland, Gloucester, Ocean, Atlantic, and Salem were low. VMT for these respective counties (with the exception of Ocean) has increased by over 10% between 1996-2005. Burlington County had moderate population growth and high VMT growth. Warren and Hunterdon counties had low population growth and VMT growth. The growth in VMT in conjunction with commuting patterns in Factor 4 provided additional information on the influence of Camden, Gloucester, and Burlington and thus they are candidates for inclusion in the Philadelphia Metropolitan area. These counties experienced VMT growth and have a moderate number of commuters into violating areas.

Factor 6: Meteorology (weather/transport patterns)

For this factor, EPA considered the most representative National Weather Service wind direction and speed data throughout the year, with an emphasis on “high PM_{2.5} days” for each of two seasons (an October-April “cold” season and a May-September “warm” season). These high days are defined as days where any FRM or FEM air-quality monitors had 24-hour PM_{2.5} concentrations above 95% on a frequency distribution curve of PM_{2.5} 24-hour values.

For each air quality monitoring site, EPA developed a “pollution rose” to understand the prevailing wind direction and wind speed on the days with highest fine particle concentrations. The figure identifies 24-hour PM_{2.5} values by color; days exceeding 35 ug/m³ are denoted with a red or black icon. A dot indicates the day occurred in the warm season; a triangle indicates the day occurred in the cool season. The center of the figure indicates the location of the air quality monitoring site, and the location of the icon in relation to the center indicates the direction from which the wind was blowing on that day. An icon that is close to the center indicates a low average wind speed on that day. Higher wind speeds are indicated when the icon is further away from the center.] For this factor, EPA also considered each county’s CES, which includes an analysis of trajectories of air masses for high PM_{2.5} days.

Camden County, NJ
Pollution Rose, 2004-2006

Existing NAA: Philadelphia-Wilmington,
CSA: Philadelphia-Camden-Vineland, PA-NJ-DE-MD
CBSA: Philadelphia-Camden-Wilmington, PA-NJ-DE-MD

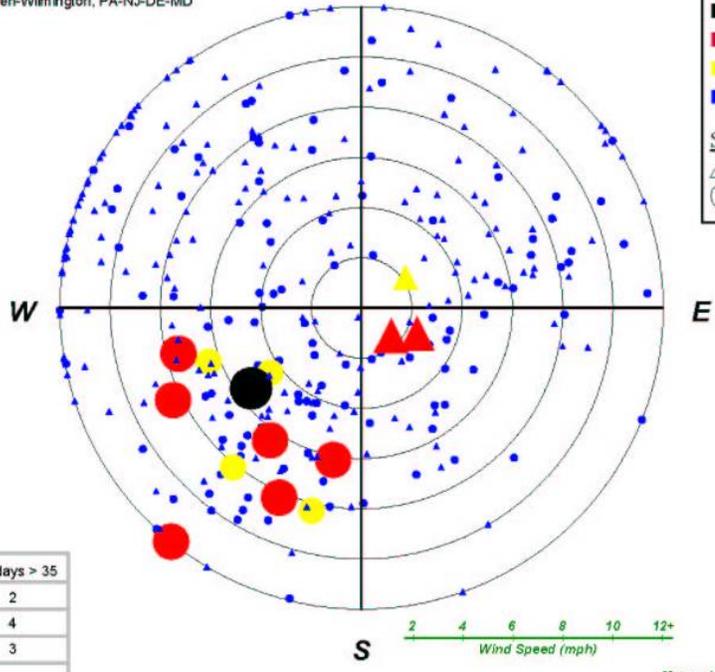
Site 340071007

Concentration:

- > 40 $\mu\text{g}/\text{m}^3$
- 35 - 40 $\mu\text{g}/\text{m}^3$
- 30 - 35 $\mu\text{g}/\text{m}^3$
- ≤ 30 $\mu\text{g}/\text{m}^3$

Season:

- △ cool (Oct-Apr)
- warm (May-Sep)



Year	98th %-ile	# days > 35
2004	34.8	2
2005	37.2	4
2006	37.8	3
Design Value	37-NA	

All exceedances plotted

Meteorological data from 12.9 miles away
PHILADELPHIA_INTERNATIONAL_AP (ID=13739)

located in near Philadelphia-Wilmington, P

Figure 24. Pollution Rose for Camden County, NJ

Philadelphia County, PA
Pollution Rose, 2004-2006

Existing NAA: Philadelphia-Wilmington,
CSA: Philadelphia-Camden-Vineland, PA-NJ-DE-MD
CBSA: Philadelphia-Camden-Wilmington, PA-NJ-DE-MD

Site 421010004

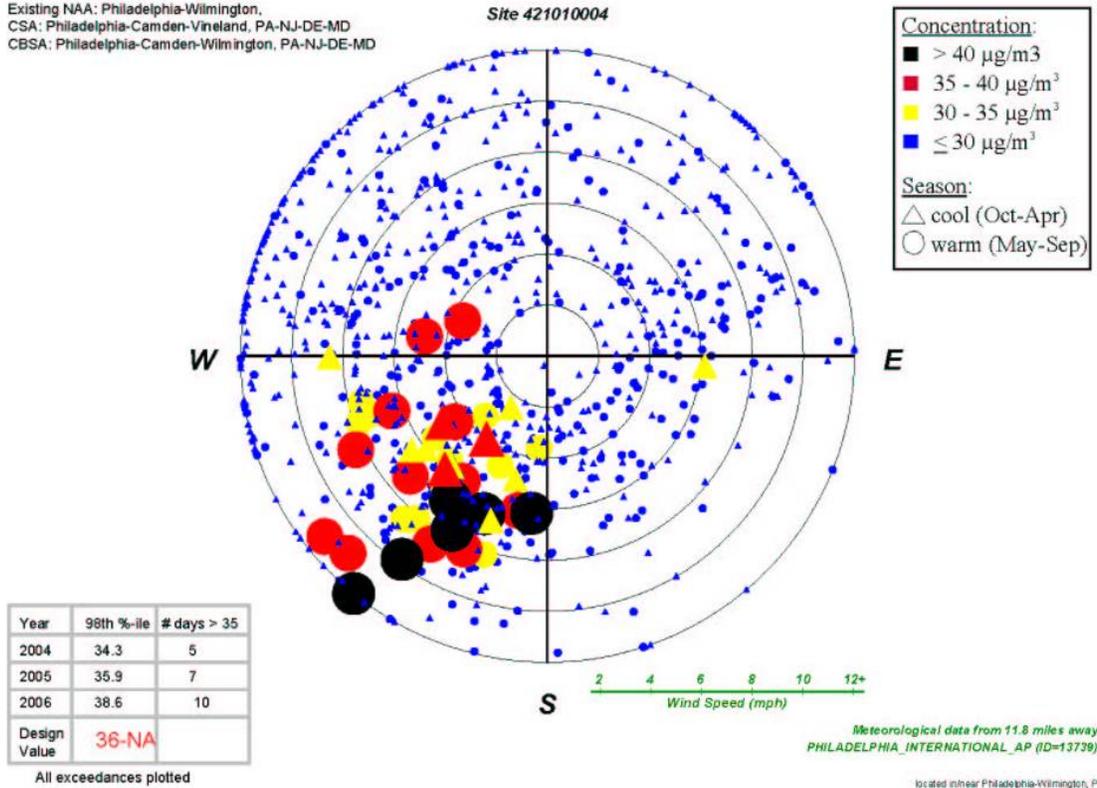


Figure 25. Pollution Rose for Philadelphia County, PA

For this factor, EPA also considered each County's CES, which includes an analysis of trajectories of air masses for high PM_{2.5} days, as well as pollution roses for the Philadelphia metropolitan area.

Table 18 shows the average prevailing surface wind directions for high PM_{2.5} days by quadrant for representative counties with violating monitors in the Philadelphia Metropolitan area. These data show that 24-hour PM_{2.5} concentrations are influenced by emissions in any direction at various times, but these data also suggest that emissions in some directions relative to the violation are more likely to contribute than emissions in other directions.

County	Prevailing Wind Direction (%)			
	NW	SW	SE	NE
Camden County, NJ	0%	83%	13%	3%
Philadelphia County, PA	5%	84%	9%	2%

Table 18. Prevailing Wind Directions for High PM_{2.5} Days

EPA's analysis of meteorology shows that PM_{2.5} emissions during high PM_{2.5} days in 2004-2006 primarily originated and/or passed through locations from a southwesterly direction. This is also evident upon examination of the pollution roses (see Figures 24 and 25) for the Philadelphia Metropolitan area.

Generally, the analysis of prevailing wind directions and pollution roses show that the counties that are in the New Jersey portion of the current 1997 PM_{2.5} NAAQS nonattainment area for Philadelphia do not rank high for this factor. In addition, the counties outside the 1997 PM_{2.5} NAAQS nonattainment area do not rank high either.

Since the prevailing wind direction is from the southwest, the New Jersey Counties rank low for this factor. Pollution roses and the prevailing wind direction did not indicate a high impact from New Jersey Counties. Based on our analysis, this factor does not support including New Jersey Counties in a Philadelphia Metropolitan nonattainment area.

Note: the meteorology factor is also considered in each county's Contributing Emissions Score because the method for deriving this metric included an analysis of trajectories of air masses for high PM_{2.5} days.

Factor 7: Geography/topography (mountain ranges or other air basin boundaries)

The geography/topography analysis looks at physical features of the land that might have an effect on the air shed and, therefore, on the distribution of PM_{2.5} over the Philadelphia metropolitan area.

The Philadelphia metropolitan area does not have any geographical or topographical barriers significantly limiting air-pollution transport within its air shed. Therefore, this factor did not play a significant role in the decision-making process.

Factor 8: Jurisdictional boundaries (e.g., existing PM and ozone areas)

In evaluating the jurisdictional boundary factor, consideration should be given to existing boundaries and organizations that may facilitate air quality planning and the implementation of control measures to attain the standard. Areas designated as nonattainment (e.g. for PM_{2.5} or 8-hour ozone standard) represent important boundaries for state air quality planning.

The major jurisdictional boundary in the Philadelphia metropolitan nonattainment area is the State lines between New Jersey, Pennsylvania, and Delaware.

All counties in New Jersey were designated nonattainment for the 8-hour ozone standard on April 15, 2004.

In EPA's June 2007 Guidance for Area Designations for the 24-hour PM_{2.5} NAAQS, EPA had indicated that we expected that the boundaries for the existing 1997 PM_{2.5} nonattainment areas would have been appropriate for the boundaries of the new nonattainment areas for the 2006 PM_{2.5} NAAQS. The following counties were included in the EPA Region 2 portion of the 1997 PM_{2.5} NAAQS nonattainment area for the Philadelphia metropolitan area: Burlington, Camden, and Gloucester Counties. Warren, Hunterdon, Ocean, Salem, Atlantic, and Cumberland Counties in New Jersey were not included in the 1997 PM_{2.5} NAAQS nonattainment area for the Philadelphia metropolitan area.

Factor 9: Level of control of emission sources

This factor considers emission controls currently implemented in the Philadelphia Metropolitan area. This factor analysis generally considered the emissions controls currently in place.

The emission estimates on Table 13 (under Factor 1) include any control strategies implemented by the States in the Philadelphia Metropolitan area before 2005 that may influence emissions of any component of PM_{2.5} emissions (i.e., total carbon, SO₂, NO_x, and crustal PM_{2.5}). Since we believe that the emissions listed in Table 13 have not changed significantly since 2005, this factor does not influence heavily in our decision-making.

In considering county-level emissions, EPA considered 2005 emissions data from the National Emissions Inventory. EPA recognizes that certain power plants or large sources of emissions in this potential nonattainment area may have installed emission controls or otherwise significantly reduced emissions since 2005 and that this information may not be reflected in this analysis. EPA will consider additional information on emission controls in making final designation decisions. In cases where specific plants already have installed emission controls or plan to install such controls in the near future, EPA requests additional information on:

- the plant name, city, county, and township/tax district
- identification of emission units at the plant, fuel use, and megawatt capacity
- identification of emission units on which controls will be installed, and units on which controls will not be installed
- identification of the type of emission control that has been or will be installed on each unit, the date on which the control device became / will become operational, and the emission reduction efficiency of the control device
- the estimated pollutant emissions for each unit before and after implementation of emission controls
- whether the requirement to operate the emission control device will be federally enforceable by December 2008, and the instrument by which federal enforceability will be ensured (e.g. through source-specific SIP revision, operating permit requirement, consent decree)

Attachment 2

Description of the Contributing Emissions Score

The CES is a metric that takes into consideration emissions data, meteorological data, and air quality monitoring information to provide a relative ranking of counties in and near an area. Using this methodology, scores were developed for each county in and around the relevant metro area. The county with the highest contribution potential was assigned a score of 100, and other county scores were adjusted in relation to the highest county. The CES represents the relative maximum influence that emissions in that county have on a violating county. The CES, which reflects consideration of multiple factors, should be considered in evaluating the weight of evidence supporting designation decisions for each area.

The CES for each county was derived by incorporating the following significant information and variables that impact PM_{2.5} transport:

- Major PM_{2.5} components: total carbon (organic carbon (OC) and elemental carbon (EC)), SO₂, NO_x, and inorganic particles (crystal).
- PM_{2.5} emissions for the highest (generally top 5%) PM_{2.5} emission days (herein called “high days”) for each of two seasons, cold (Oct-Apr) and warm (May-Sept)
- Meteorology on high days using the NOAA HYSPLIT model for determining trajectories of air masses for specified days
- The “urban increment” of a violating monitor, which is the urban PM_{2.5} concentration that is in addition to a regional background PM_{2.5} concentration, determined for each PM_{2.5} component
- Distance from each potentially contributing county to a violating county or counties

A more detailed description of the CES can be found at http://www.epa.gov/ttn/naqs/pm/pm25_2006_techinfo.html#C.